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Moore et al.

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(54) **LIFE STREAMING**

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H04N 21/2187 (2011.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04N 21/2187*** (2013.01); ***H04N 5/77*** (2013.01); ***H04N 21/2743*** (2013.01); ***H04N 21/4223*** (2013.01); ***H04N 21/42203*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 7/181; H04N 21/2187; H04N 21/4334; H04N 7/17318; H04N 21/26208; H04N 21/4147; H04N 21/4223; H04N 21/44008; H04N 21/47214; H04N 21/84; H04N 21/23106; H04N 21/25891; H04N 21/26603; H04N 21/2668; H04N 21/4622; H04N 7/18
USPC 370/338; 386/240, 461, 200, 224, 239, 386/241, 248, E05.002, E07.018; 382/118
See application file for complete search history.

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(Continued)

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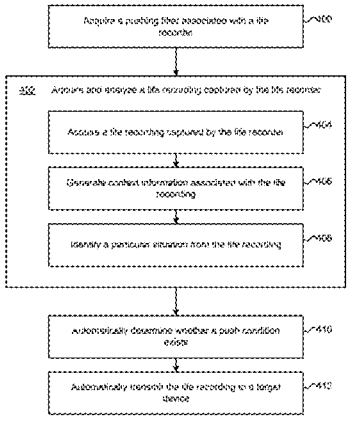
(57) **ABSTRACT**

A system and method for analyzing, summarizing, and transmitting life experiences captured using a life recorder is described. A life recorder is a recording device that continuously captures life experiences, including unanticipated life experiences, in video and/or audio recordings. In some embodiments, the video and/or audio recordings generated by a life recorder are automatically summarized, indexed, and stored for future use. By indexing and storing life recordings, a life recorder may search for and acquire life recordings generated by itself or another life recorder, thereby allowing life experiences to be shared minutes or even years later. In some embodiments, recordings generated by a life recorder may be analyzed in real-time and automatically pushed to one or more target devices. The ability to automatically and instantaneously push life recordings as live feeds to one or more target devices allows friends and family to experience one's life experience in real-time.

11 Claims, 16 Drawing Sheets



(51) **Int. Cl.**

H04N 5/77	(2006.01)
H04N 21/2743	(2011.01)
H04N 21/422	(2011.01)
H04N 21/4223	(2011.01)
H04N 21/433	(2011.01)
H04N 21/4788	(2011.01)
H04N 9/82	(2006.01)

(52) **U.S. Cl.**

CPC ***H04N21/4334*** (2013.01); ***H04N 21/4788*** (2013.01); *H04N 9/8227* (2013.01)

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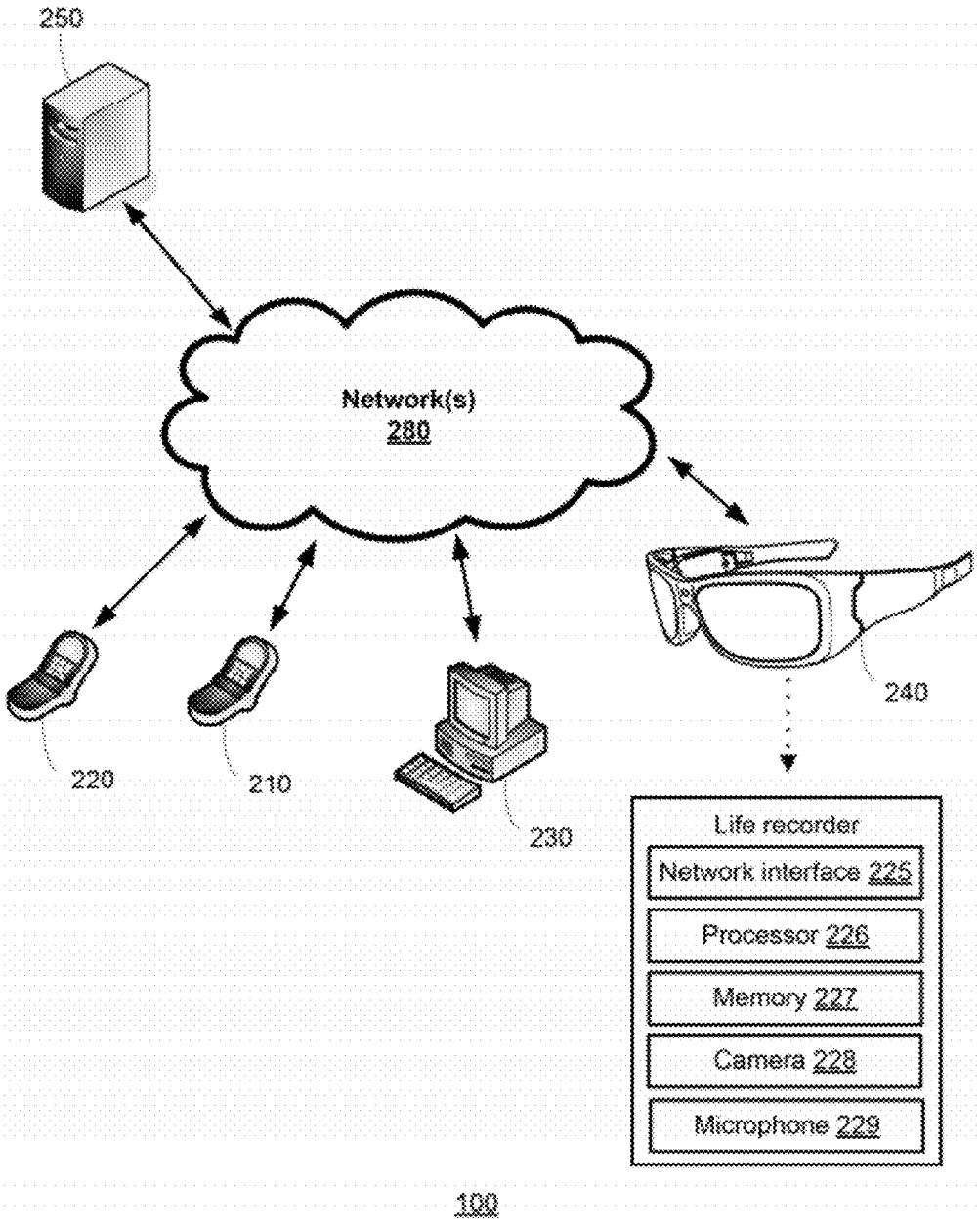

250
Network(s)
280
220
210
230
240
Life recorder
Network interface 225
Processor 226
Memory 227
Camera 228
Microphone 229
100

FIG. 1A

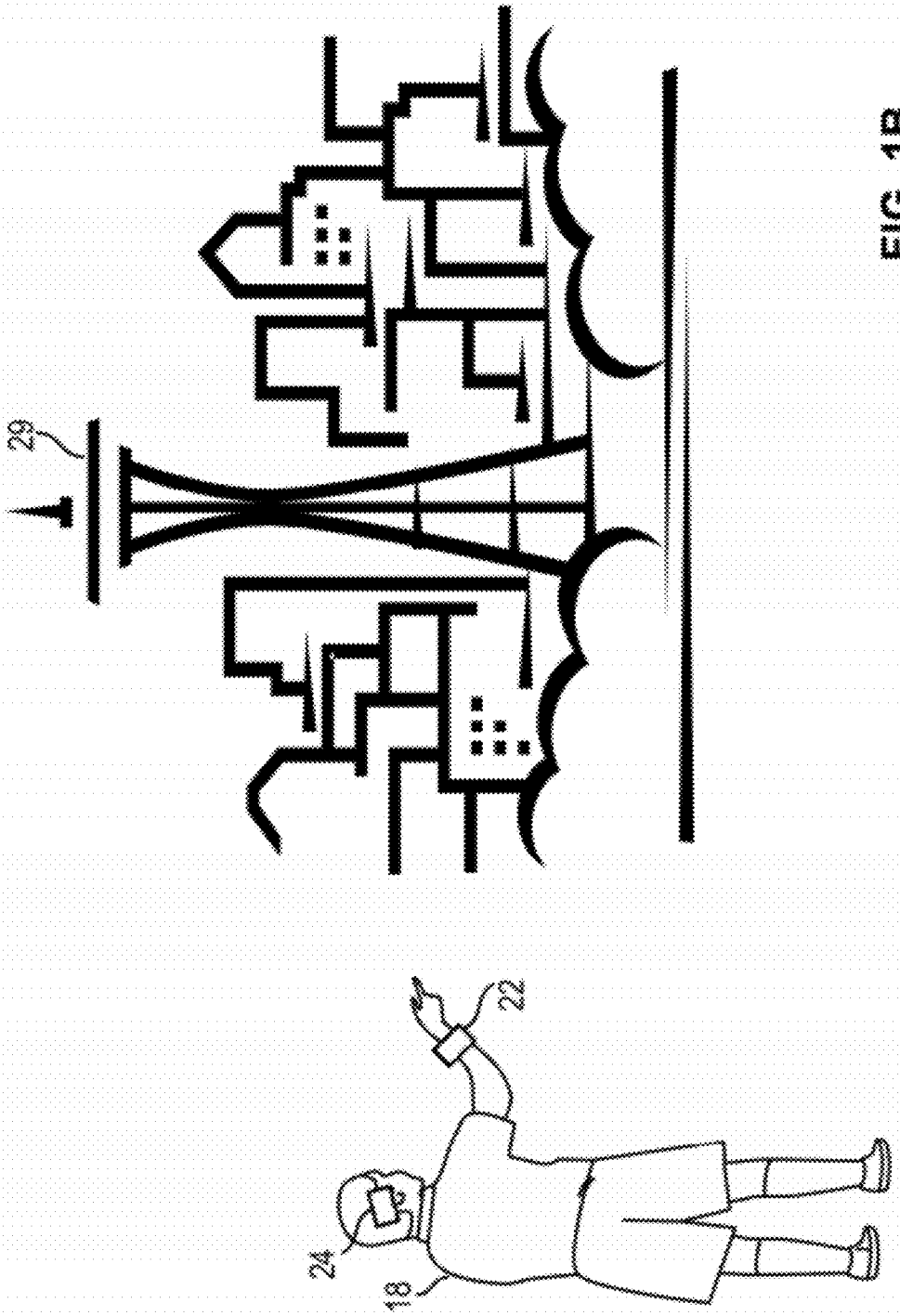


FIG. 1B

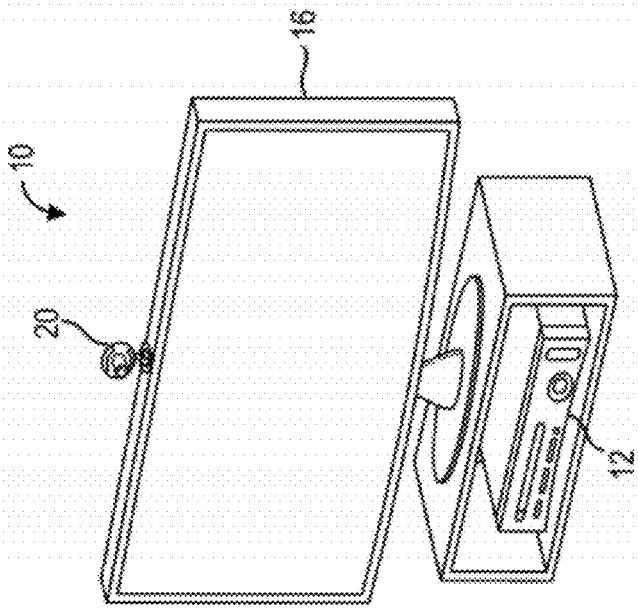
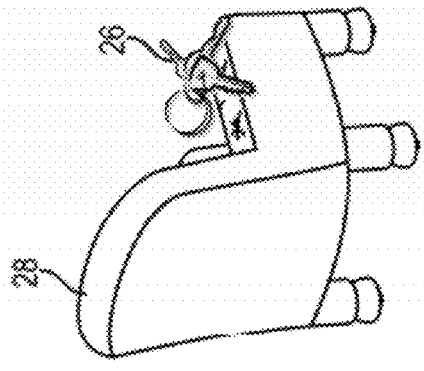


FIG. 1C



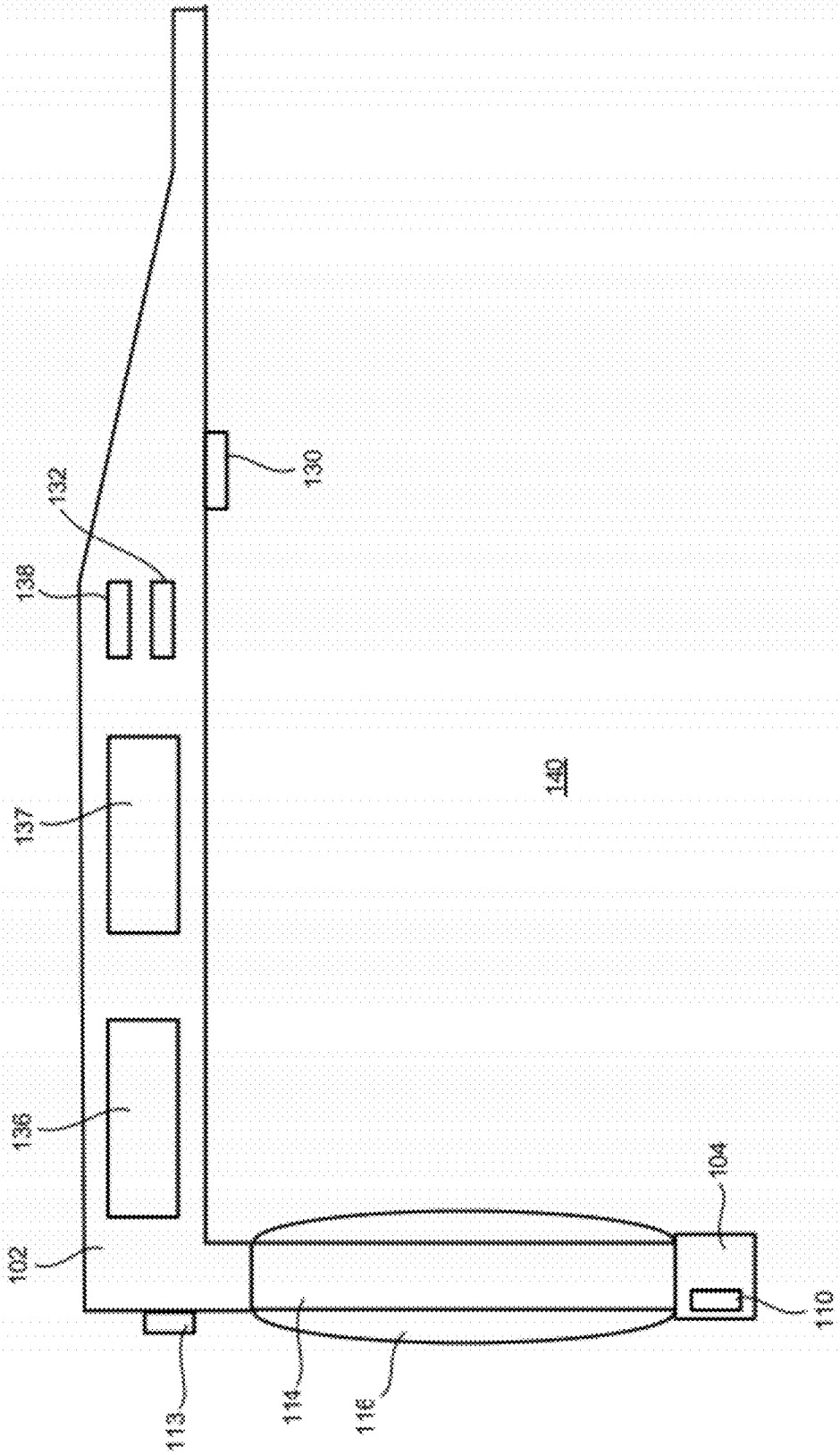


FIG. 2A

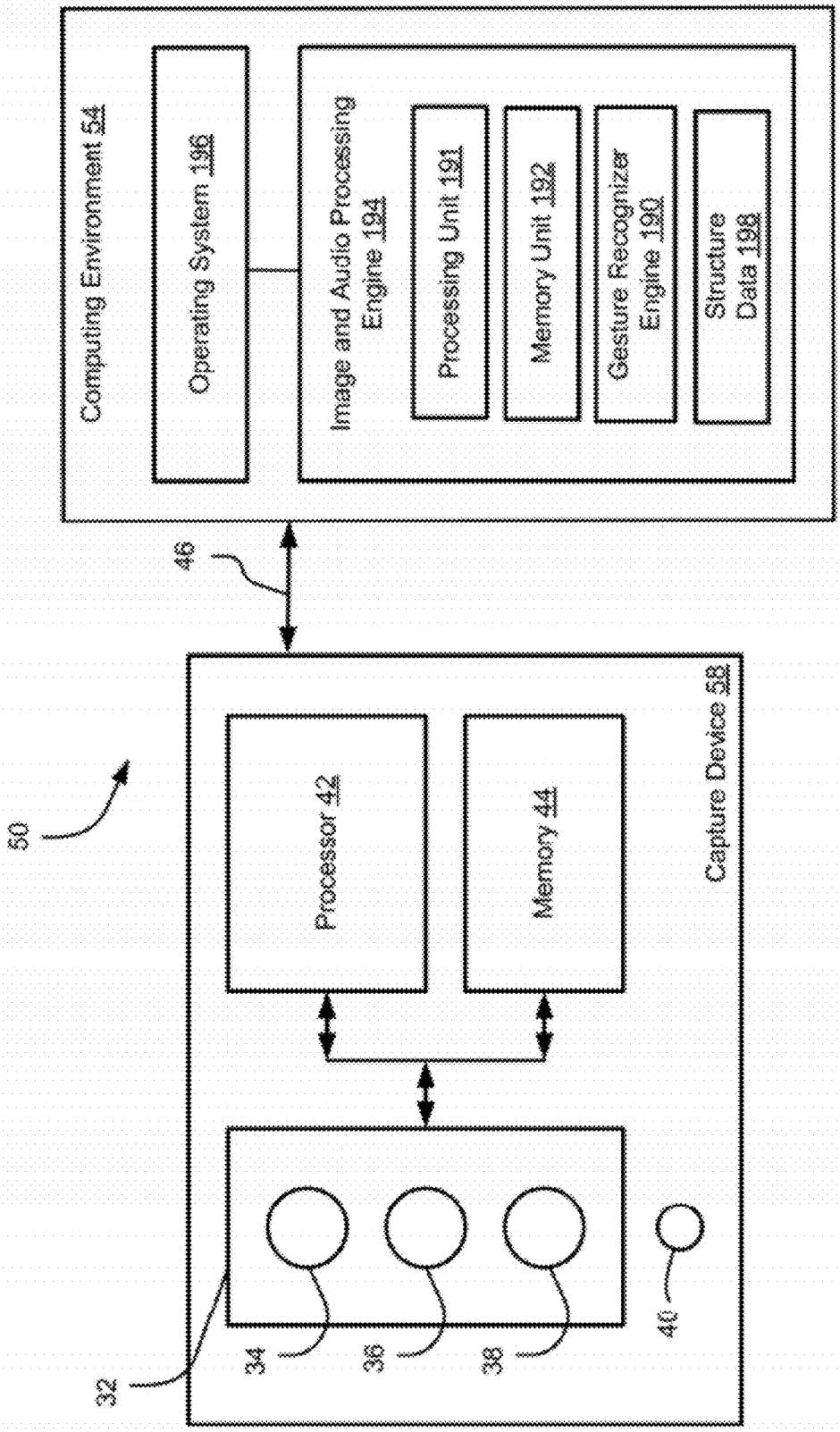

Computing Environment 54
Operating System 196
Image and Audio Processing Engine 194
Processing Unit 191
Memory Unit 192
Gesture Recognizer Engine 190
Structure Data 198
46
50
Capture Device 58
Processor 42
Memory 44
32
34
36
38
40

FIG. 2B

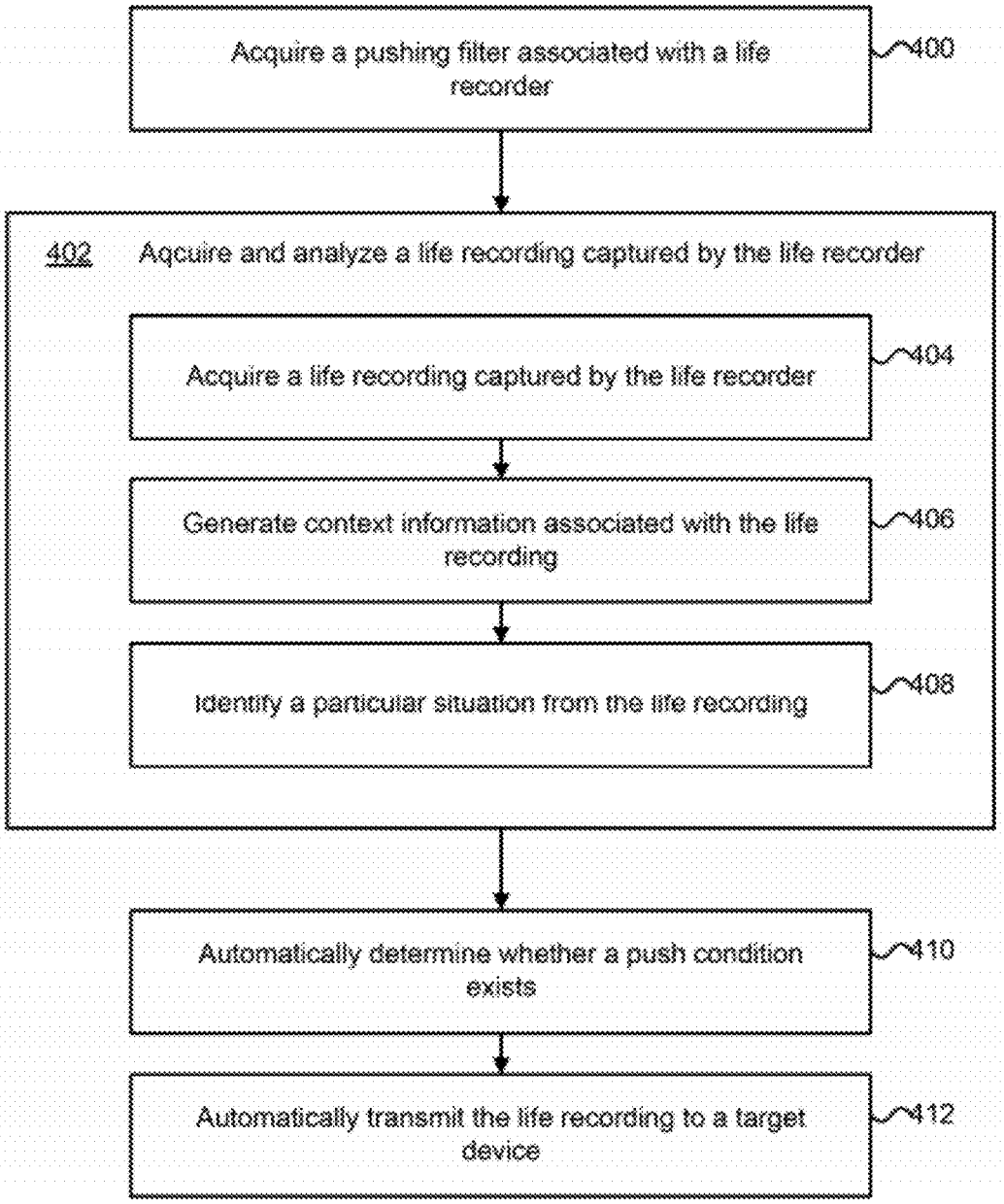

Acquire a pushing filter associated with a life recorder
400
402
Aqcuire and analyze a life recording captured by the life recorder
Acquire a life recording captured by the life recorder
404
Generate context information associated with the life recording
406
Identify a particular situation from the life recording
408
Automatically determine whether a push condition exists
410
Automatically transmit the life recording to a target device
412

FIG. 3

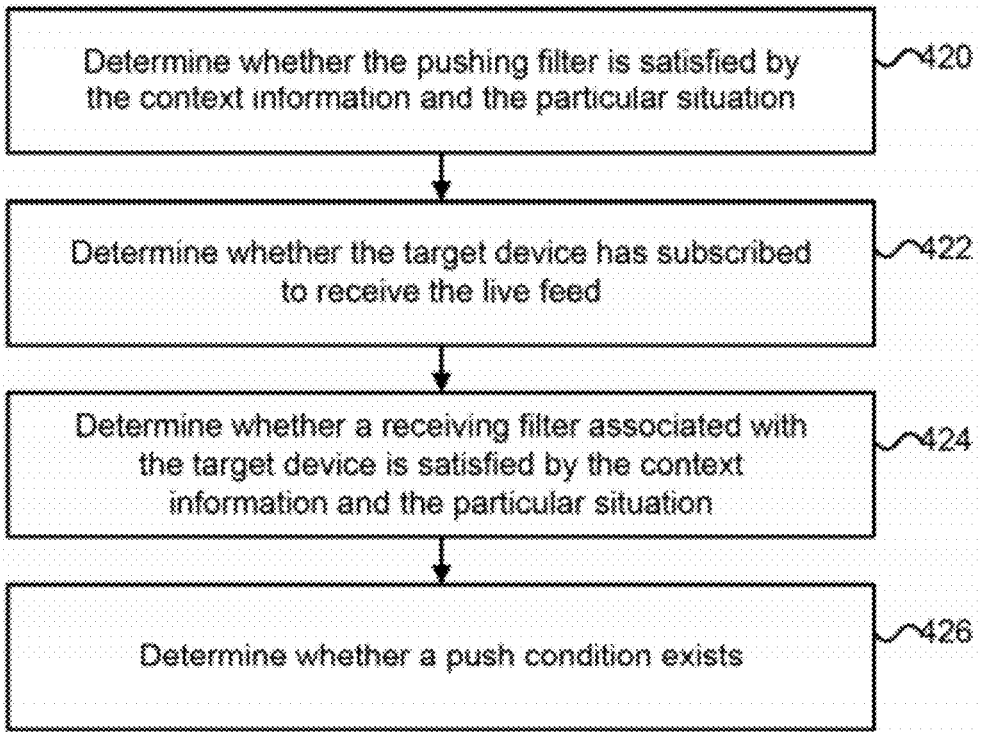

Determine whether the pushing filter is satisfied by the context information and the particular situation
420
Determine whether the target device has subscribed to receive the live feed
422
Determine whether a receiving filter associated with the target device is satisfied by the context information and the particular situation
424
Determine whether a push condition exists
426

FIG. 4A

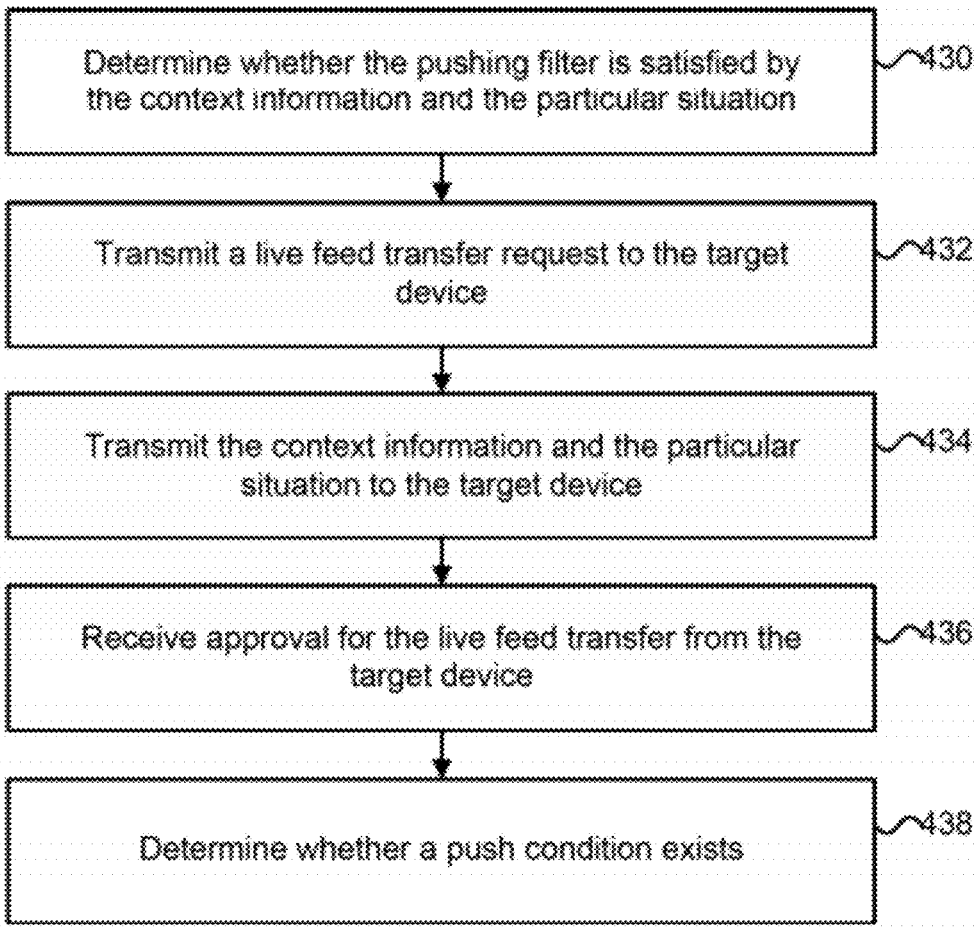

Determine whether the pushing filter is satisfied by the context information and the particular situation
430
Transmit a live feed transfer request to the target device
432
Transmit the context information and the particular situation to the target device
434
Receive approval for the live feed transfer from the target device
436
Determine whether a push condition exists
438

FIG. 4B

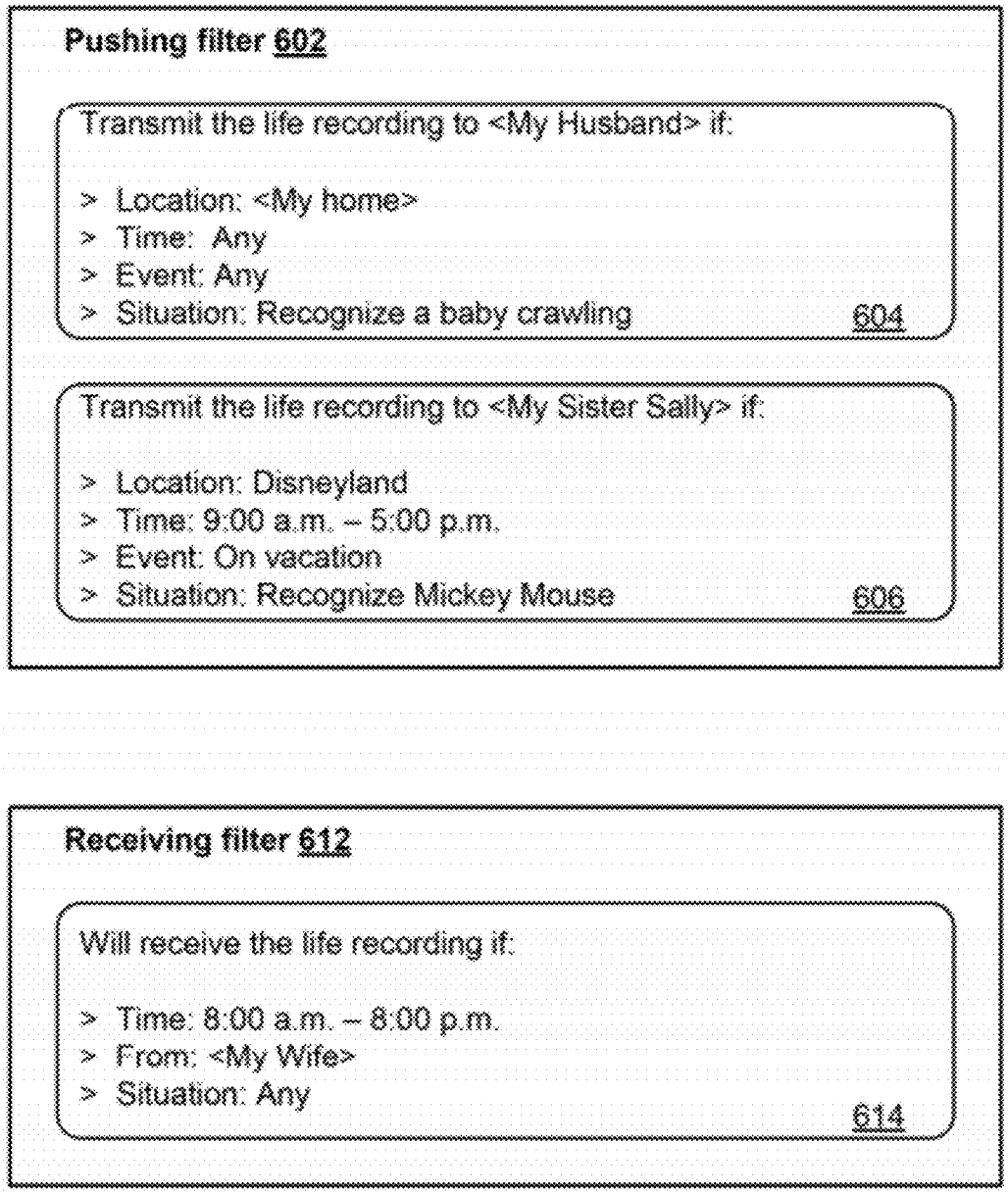

Pushing filter 602
Transmit the life recording to <My Husband> if:
> Location: <My home>
> Time: Any
> Event: Any
> Situation: Recognize a baby crawling
604
Transmit the life recording to <My Sister Sally> if:
> Location: Disneyland
> Time: 9:00 a.m. – 5:00 p.m.
> Event: On vacation
> Situation: Recognize Mickey Mouse
606
Receiving filter 612
Will receive the life recording if:
> Time: 8:00 a.m. – 8:00 p.m.
> From: <My Wife>
> Situation: Any
614

FIG. 4C

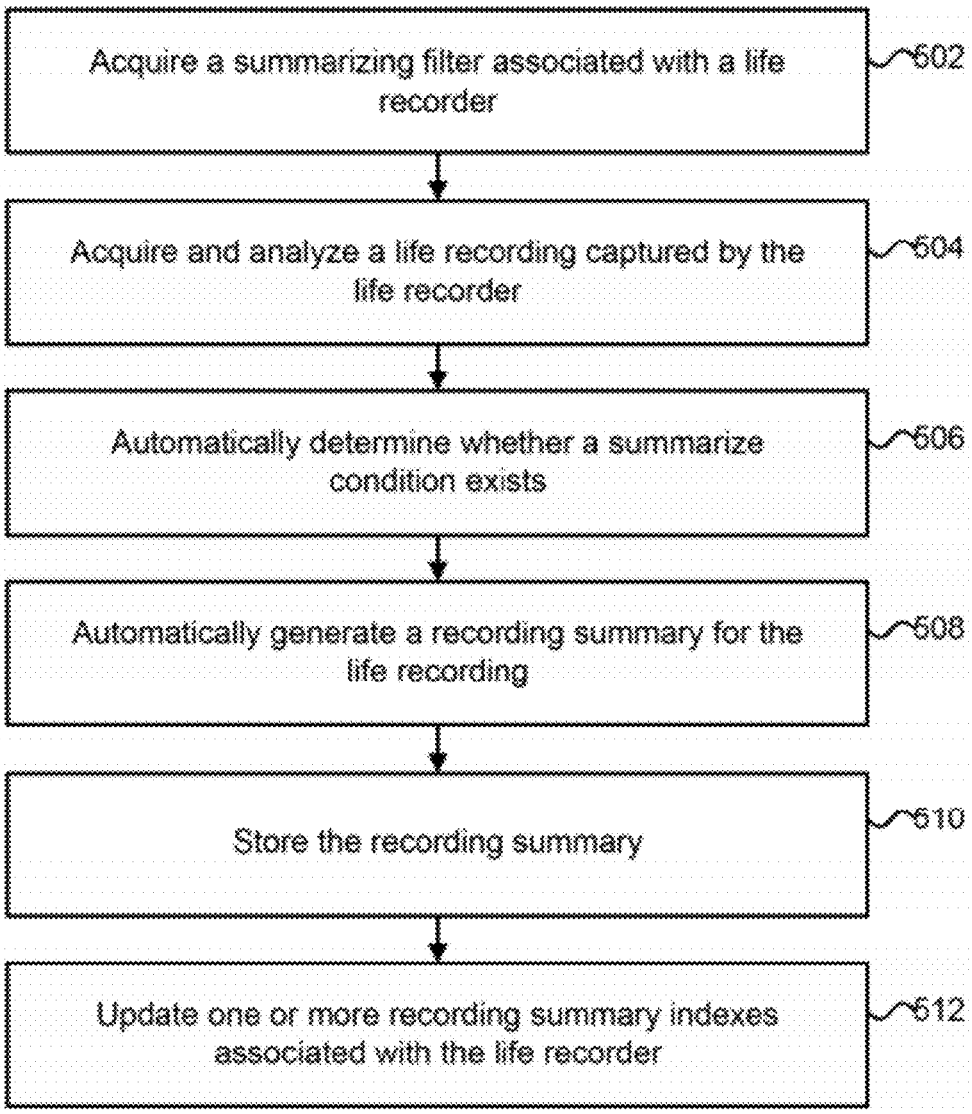

Acquire a summarizing filter associated with a life recorder
602
Acquire and analyze a life recording captured by the life recorder
604
Automatically determine whether a summarize condition exists
606
Automatically generate a recording summary for the life recording
608
Store the recording summary
610
Update one or more recording summary indexes associated with the life recorder
612

FIG. 5

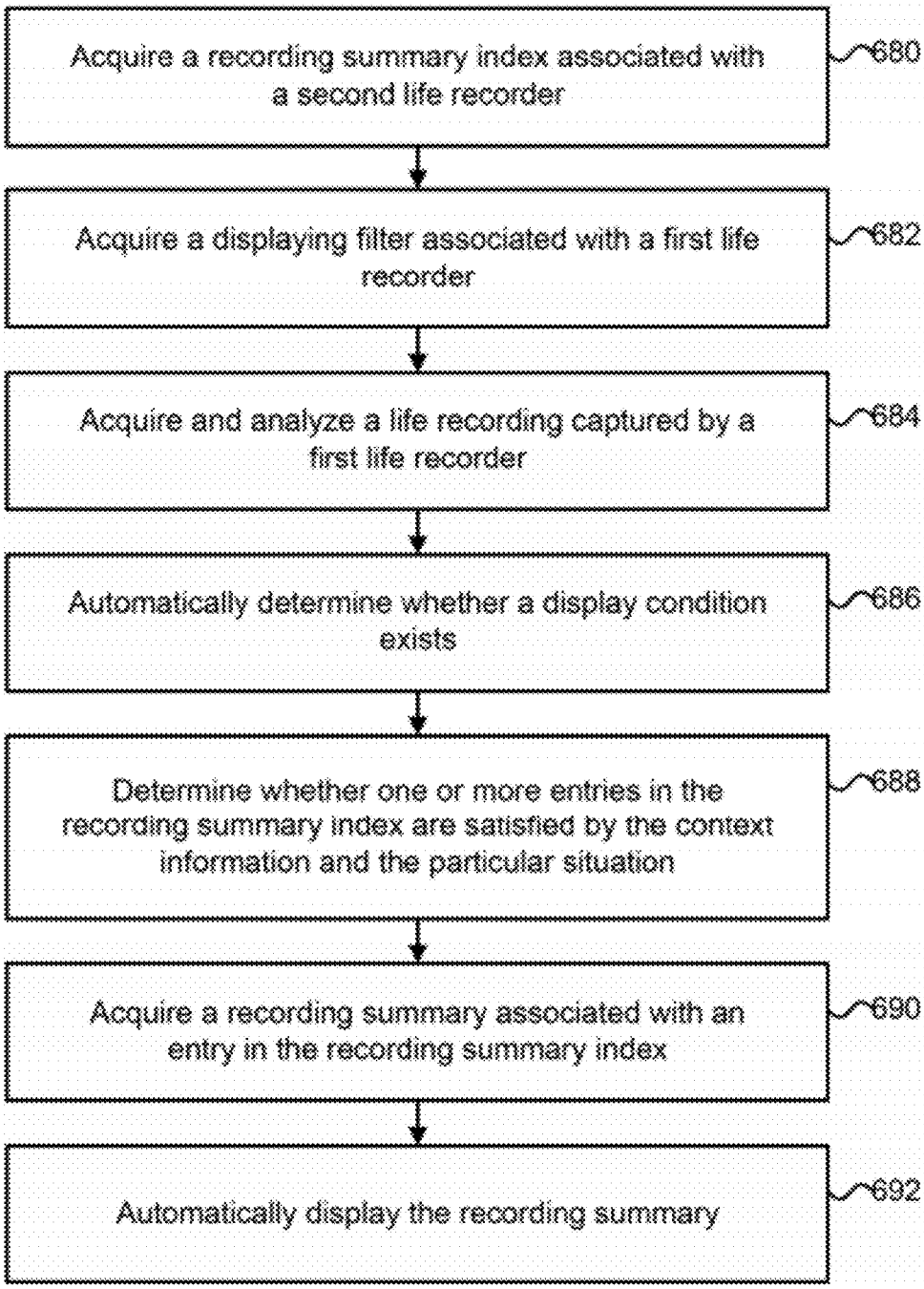

Acquire a recording summary index associated with a second life recorder
680
Acquire a displaying filter associated with a first life recorder
682
Acquire and analyze a life recording captured by a first life recorder
684
Automatically determine whether a display condition exists
686
Determine whether one or more entries in the recording summary index are satisfied by the context information and the particular situation
688
Acquire a recording summary associated with an entry in the recording summary index
690
Automatically display the recording summary
692

FIG. 6A

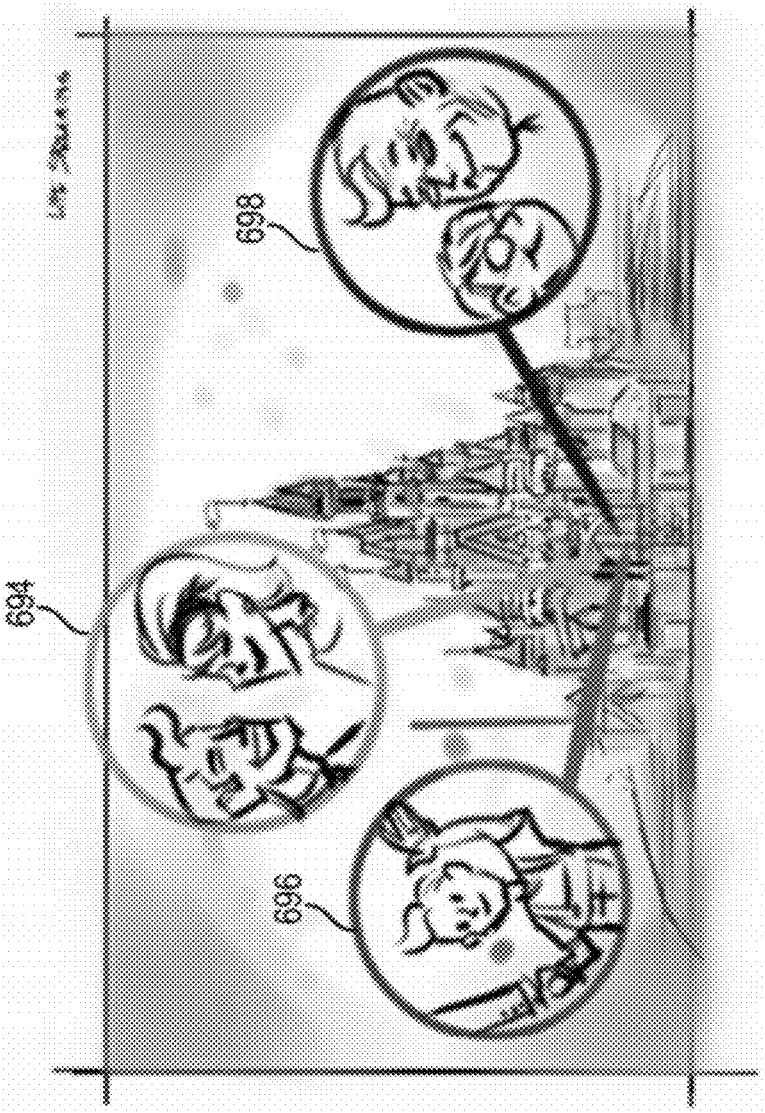


FIG. 6B

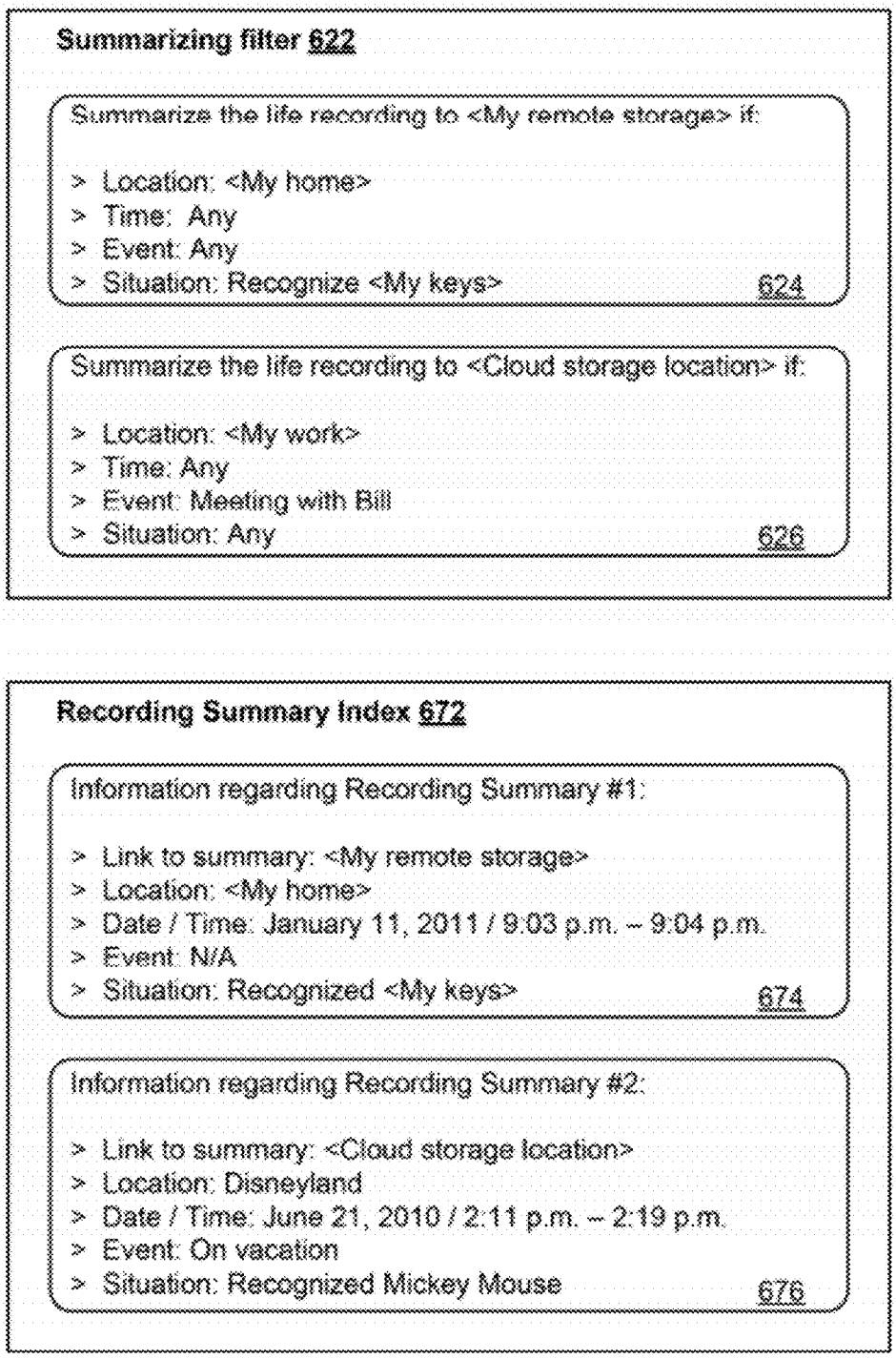

Summarizing filter 622
Summarize the life recording to <My remote storage> if:
> Location: <My home>
> Time: Any
> Event: Any
> Situation: Recognize <My keys>
624
Summarize the life recording to <Cloud storage location> if:
> Location: <My work>
> Time: Any
> Event: Meeting with Bill
> Situation: Any
626
Recording Summary Index 672
Information regarding Recording Summary #1:
> Link to summary: <My remote storage>
> Location: <My home>
> Date / Time: January 11, 2011 / 9:03 p.m. – 9:04 p.m.
> Event: N/A
> Situation: Recognized <My keys>
674
Information regarding Recording Summary #2:
> Link to summary: <Cloud storage location>
> Location: Disneyland
> Date / Time: June 21, 2010 / 2:11 p.m. – 2:19 p.m.
> Event: On vacation
> Situation: Recognized Mickey Mouse
676

FIG. 7

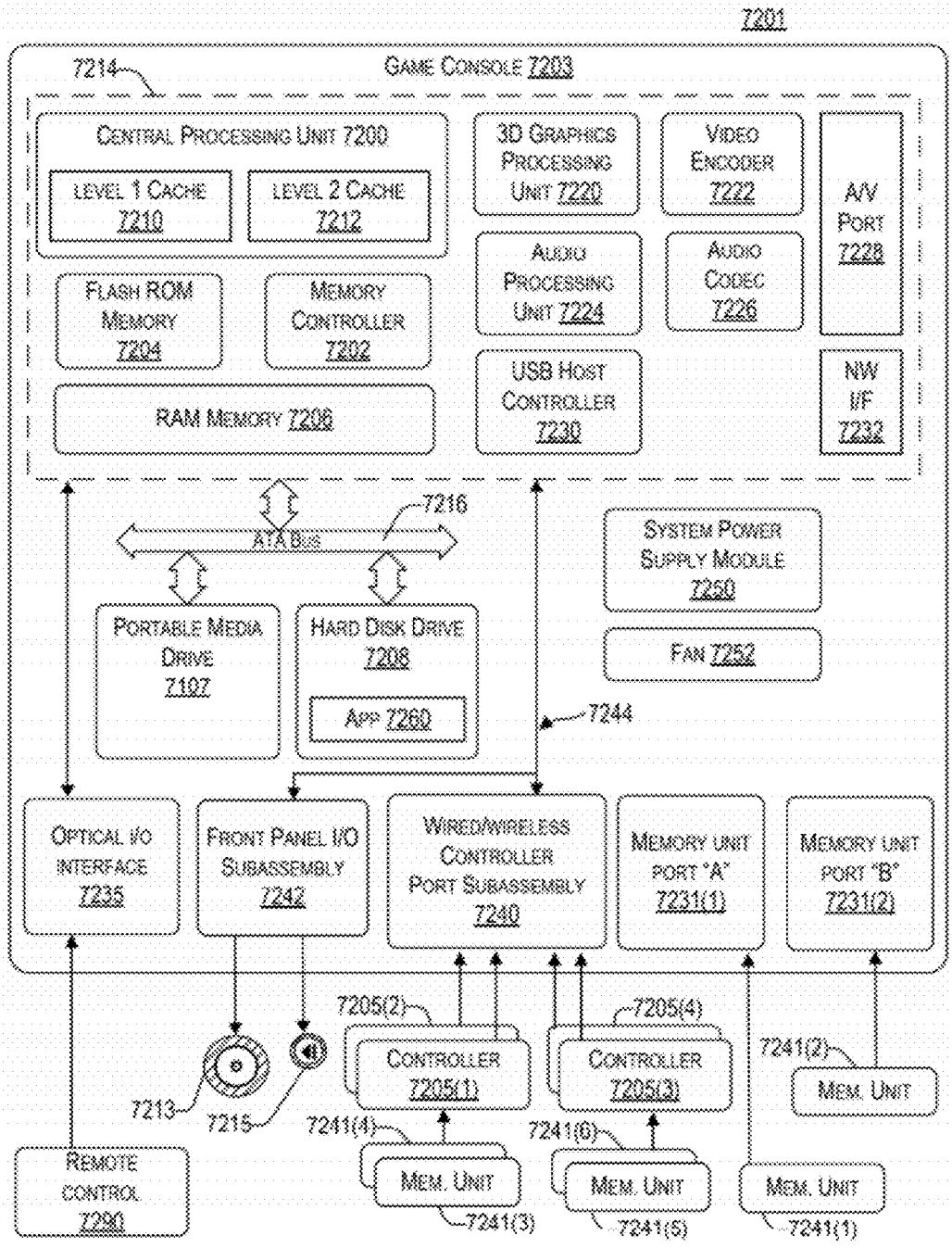

7201
7214
GAME CONSOLE 7203
CENTRAL PROCESSING UNIT 7200
LEVEL 1 CACHE 7210
LEVEL 2 CACHE 7212
3D GRAPHICS PROCESSING UNIT 7220
VIDEO ENCODER 7222
A/V PORT 7228
AUDIO PROCESSING UNIT 7224
AUDIO CODEC 7226
FLASH ROM MEMORY 7204
MEMORY CONTROLLER 7202
USB HOST CONTROLLER 7230
NW I/F 7232
RAM MEMORY 7206
7216
ATA BUS
SYSTEM POWER SUPPLY MODULE 7250
FAN 7252
PORTABLE MEDIA DRIVE 7107
HARD DISK DRIVE 7208
APP 7260
7244
OPTICAL I/O INTERFACE 7235
FRONT PANEL I/O SUBASSEMBLY 7242
WIRED/WIRELESS CONTROLLER PORT SUBASSEMBLY 7240
MEMORY UNIT PORT "A" 7231(1)
MEMORY UNIT PORT "B" 7231(2)
7205(2)
7205(4)
CONTROLLER 7205(1)
CONTROLLER 7205(3)
7241(2)
MEM. UNIT
7213
7215
7241(4)
7241(6)
REMOTE CONTROL 7290
MEM. UNIT
MEM. UNIT
MEM. UNIT
7241(3)
7241(5)
7241(1)

FIG. 8

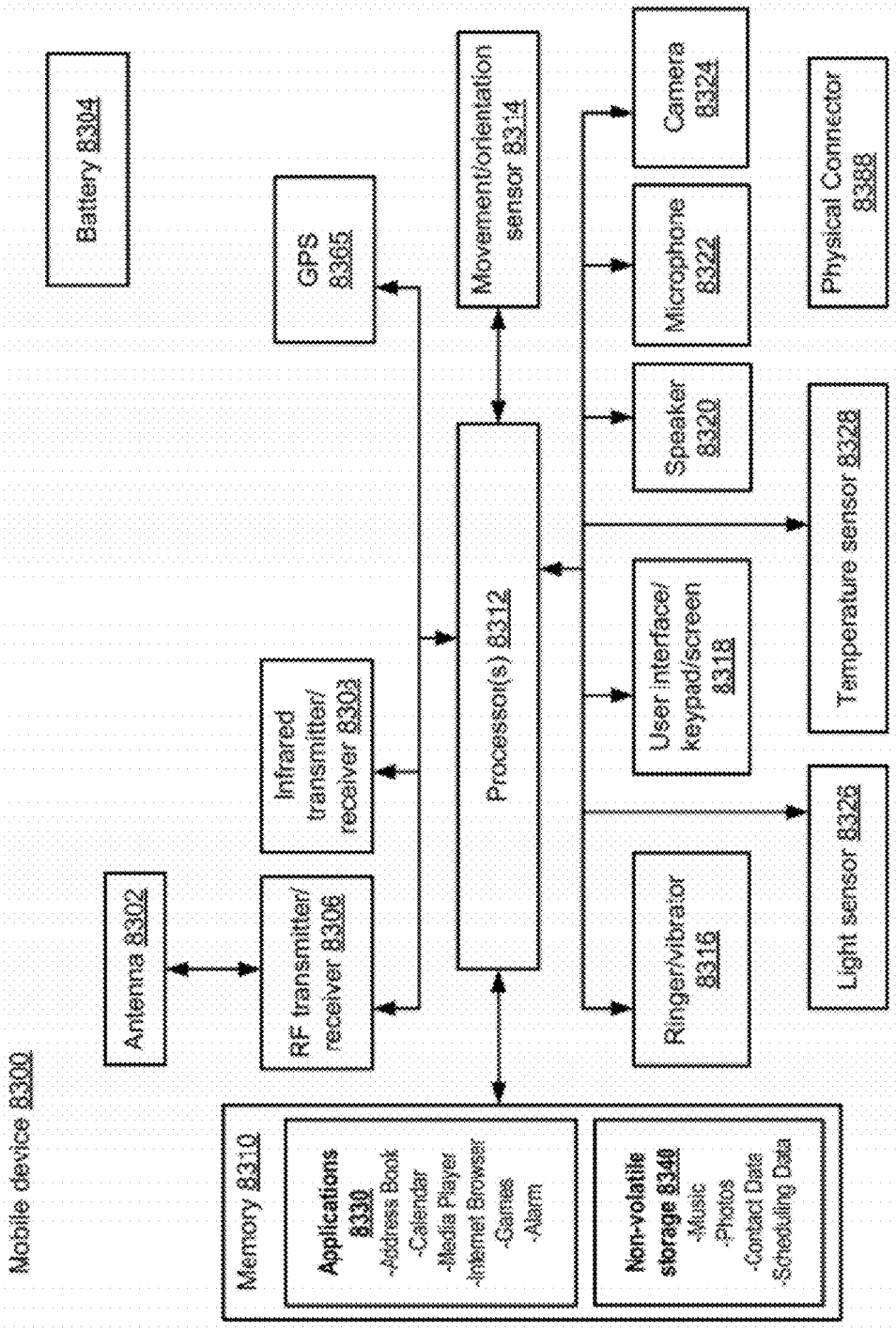

Mobile device 8300
Battery 8304
Antenna 8302
RF transmitter/ receiver 8306
Infrared transmitter/ receiver 8303
GPS 8365
Processor(s) 8312
Movement/orientation sensor 8314
Memory 8310
Applications 8330
-Address Book
-Calendar
-Media Player
-Internet Browser
-Games
-Alarm
Non-volatile storage 8340
-Music
-Photos
-Contact Data
-Scheduling Data
Ringer/vibrator 8316
User interface/ keypad/screen 8318
Speaker 8320
Microphone 8322
Camera 8324
Light sensor 8326
Temperature sensor 8328
Physical Connector 8388

FIG. 9

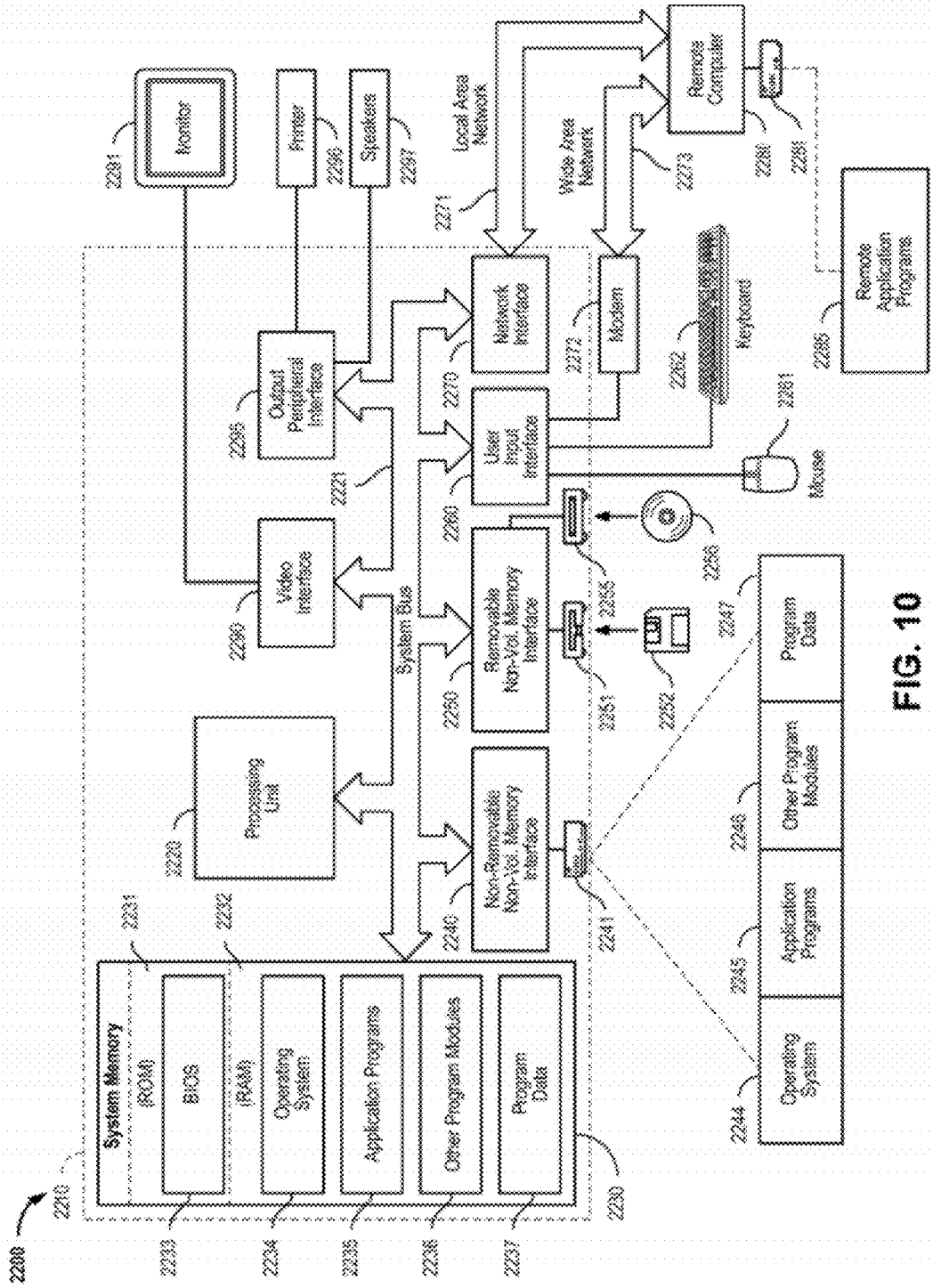

2280
2210
System Memory
ROM
RAM
BIOS
Operating System
Application Programs
Other Program Modules
Program Data
2231
2232
2233
2234
2235
2236
2237
2220
Processing Unit
2230
System Bus
2221
Video Interface
2290
Output Peripheral Interface
2295
Monitor
2291
Printer
2296
Speakers
2297
Network Interface
2270
Modem
2272
Local Area Network
2271
Wide Area Network
2273
Remote Computer
2281
2280
Remote Application Programs
2285
User Input Interface
2260
Keyboard
2262
Mouse
2261
Removable Non-Vol. Memory Interface
2250
Non-Removable Non-Vol. Memory Interface
2240
2241
2251
2252
2255
2256
Operating System
2244
Application Programs
2245
Other Program Modules
2246
Program Data
2247

FIG. 10

LIFE STREAMING

BACKGROUND

Today, many mobile devices such as cell phones and digital cameras employ camera technology capable of recording digital images and videos. The proliferation of camera technology combined with the ability to cheaply capture digital images has allowed camera users to capture more life experiences than was previously feasible. The process of capturing images typically requires a conscious effort from the camera user to select a field of view and/or to determine when to capture the image. In the most typical example, a camera user must position the camera in the direction of a particular field of view and activate a trigger for capturing the image. Although the trigger for capturing an image may be automated using a timing or motion-sensing device, a conscious effort from the camera user is still required to determine the particular field of view (e.g., the placement of a security or traffic camera).

With the widespread adoption of the Internet, camera users may transmit or publish digital images immediately after being captured and recorded. For example, digital images may be immediately emailed to friends or uploaded to social networking websites. However, despite the advances in camera technology and the ability to exchange information over the Internet in real-time, people still miss events and experiences that they would have wanted to share or participate in.

SUMMARY

Technology is described for analyzing, summarizing, and transmitting life experiences captured using a life recorder. A life recorder is a recording device that continuously captures life experiences, including unanticipated life experiences, in image, video, and/or audio recordings. In some embodiments, the video and/or audio recordings generated by a life recorder are automatically summarized, indexed, and stored for future use. By indexing and storing life recordings, a life recorder may search for and acquire life recordings generated by itself or another life recorder, thereby allowing life experiences to be shared minutes or even years later. In some embodiments, recordings generated by a life recorder may be analyzed in real-time and automatically pushed to one or more target devices. The ability to automatically and instantaneously push life recordings as live feeds to one or more target devices allows friends and family to experience one's life experience as it is happening.

One embodiment includes acquiring a pushing filter associated with a life recorder and which includes one or more requirements for determining when to transfer data from the life recorder to a target device, acquiring a life recording, generating context information associated with the life recording, identifying a particular situation from the life recording, detecting a push condition including automatically comparing the particular situation with the one or more requirements and automatically comparing the context information with the one or more requirements, and automatically transmitting data associated with the life recording to the target device in response to detecting the push condition.

One embodiment includes acquiring one or more requirements for determining when to display data associated with a second life recorder, acquiring a recording summary index associated with the second life recording, acquiring a life recording at a first life recorder, generating context information associated with the life recording, identifying a particular situation from the life recording, detecting a display condition including automatically comparing the particular situation with the one or more requirements and automatically comparing the context information with the one or more requirements, receiving a recording summary associated with an entry in the recording summary index, and automatically displaying the recording summary in response to detecting the display condition and receiving the recording summary.

On embodiment includes a digital video camera and one or more processors. The digital video camera captures a live feed. The one or more processors are in communication with the digital video camera. The one or more processors receive one or more requirements for pushing the live feed to a target device, generate context information associated with the live feed, identify a particular situation from the live feed, determine whether the one or more requirements are satisfied by the context information and the particular situation, receive a receiving filter from the target device, determine whether the receiving filter is satisfied by the context information and the particular situation, and transmit at least a portion of the live feed to the target device.

This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**A is a block diagram of one embodiment of a networked computing environment in which the disclosed technology may be practiced.

FIG. **1**B depicts the use of mobile life recorders to record a person's life experiences.

FIG. **1**C depicts the use of a non-mobile life recorder in a home environment.

FIG. **2**A depicts one embodiment of a portion of a head-mounted life recorder.

FIG. **2**B illustrates one embodiment of a life recorder including a capture device and computing environment.

FIG. **3** is a flowchart describing one embodiment of a process for automatically pushing life recordings to one or more target devices.

FIGS. **4**A-**4**B include flowcharts describing embodiments of a process for automatically detecting the existence of a push condition.

FIG. **4**C depicts one embodiment of a pushing filter and a receiving filter.

FIG. **5** is a flowchart describing one embodiment of a process for automatically summarizing life recordings and updating recording summaries.

FIG. **6**A is a flowchart describing one embodiment of a process for automatically displaying on a first life recorder life recordings associated with a second life recorder.

FIG. **6**B illustrates a grandson and grandfather visiting a theme park together and utilizing the process of FIG. **6**A.

FIG. **7** depicts one embodiment of a summarizing filter and a recording summary index.

FIG. **8** is a block diagram of an embodiment of a gaming and media system.

FIG. **9** is a block diagram of an embodiment of a mobile device.

FIG. **10** is a block diagram of an embodiment of a computing system environment.

DETAILED DESCRIPTION

Technology is described for analyzing, summarizing, and transmitting life experiences captured using a life recorder. A

life recorder is a recording device that continuously captures life experiences, including unanticipated life experiences, in image, video, and/or audio recordings. In some embodiments, the video and/or audio recordings generated by a life recorder are automatically summarized, indexed, and stored for future use. By indexing and storing life recordings, a life recorder may search for and acquire life recordings generated by itself or another life recorder, thereby allowing life experiences to be shared minutes or even years later. In some embodiments, recordings generated by a life recorder may be analyzed in real-time and automatically pushed to one or more target devices. The ability to automatically and instantaneously push life recordings as live feeds to one or more target devices allows friends and family to experience one's life experience as it is happening.

The life experiences captured by a life recorder may be summarized, indexed, and stored in a searchable digital archive. The searchable digital archive may comprise a remote storage and/or application server. A searchable digital archive of captured life experiences has many practical applications including allowing users of a computing device to search for and download life recordings associated with where they last saw their house keys, when and where they first met someone, and what was said during an unexpected conversation. The life recordings generated by users of one or more different life recorders may also be searched and downloaded. With a searchable digital archive, people no longer need to rely on their sometimes faulty or inaccurate memories when sharing or reliving life experiences.

Moreover, the life experiences captured by a life recorder may also be buffered and automatically analyzed for detection of a particular condition. Upon detection of the particular condition, the life recorder may automatically transmit or push a life recording as a live feed to another computing device. The ability to automatically push a life recording in real-time may be especially useful when the person wearing the life recorder is not able to perform steps necessary to transmit the life recording by themselves (e.g., when a child or non-lucid elderly parent are in need of assistance).

FIG. **1**A is a block diagram of one embodiment of a networked computing environment **100** in which the disclosed technology may be practiced. Networked computing environment **100** includes a plurality of computing devices interconnected through one or more networks **280**. The one or more networks **280** allow a particular computing device to connect to and communicate with another computing device. The depicted computing devices include life recorder **240**, mobile devices **220** and **210**, desktop computer **230**, and application server **250**. In some embodiments, the plurality of computing devices may include other computing devices not shown. In some embodiments, the plurality of computing devices may include more than or less than the number of computing devices shown in FIG. **1**A. The one or more networks **280** may include a secure network such as an enterprise private network, an unsecure network such as a wireless open network, a local area network (LAN), a wide area network (WAN), and the Internet. Each network of the one or more networks **280** may include hubs, bridges, routers, switches, and wired transmission media such as a wired network or direct-wired connection.

An application server, such as application server **250**, may allow a client to download content (e.g., audio, image, and video files) from the application server or to perform a search query related to the content. In one example, a client may download video and audio recordings associated with a life recorder. In general, a "server" may include a hardware device that acts as the host in a client-server relationship or a software process that shares a resource with or performs work for one or more clients. Communication between computing devices in a client-server relationship may be initiated by a client sending a request to the server asking for access to a particular resource or for particular work to be performed. The server may subsequently perform the actions requested and send a response back to the client.

One embodiment of life recorder **240** includes a camera **228**, microphone **229**, network interface **225**, processor **226**, and memory **227**, all in communication with each other. Camera **228** may capture digital images and/or videos. Microphone **229** may capture sounds. Network interface **225** allows life recorder **240** to connect to one or more networks **280**. Network interface **225** may include a wireless network interface, a modem, and/or a wired network interface. Processor **226** allows life recorder **240** to execute computer readable instructions stored in memory **227** to perform the processes discussed herein.

Networked computing environment **100** may provide a cloud computing environment for one or more computing devices. Cloud computing refers to Internet-based computing, wherein shared resources, software, and/or information are provided to one or more computing devices on-demand via the Internet (or other global network). The term "cloud" is used as a metaphor for the Internet, based on the cloud drawings used in computer network diagrams to depict the Internet as an abstraction of the underlying infrastructure it represents.

In one embodiment, life recorder **240** captures a life recording, buffers and analyzes the life recording in real-time, and automatically transmits the life recording as a live feed to a computing device such as mobile device **210**. In another embodiment, application server **250** is used as a remote storage server for life recordings. By indexing and storing life recordings on application server **250**, other computing devices, such as life recorder **240**, may search for and download life recordings associated with other life recorders. In one example, life recorder **240** captures a first life recording, buffers and analyzes the first life recording in real-time, analyzes a recording summary index associated with a different life recorder, downloads a second life recording associated with the different life recorder from application server **250**, and displays the second life recording.

FIG. **1**B depicts the use of mobile life recorders to record a person's life experiences. Mobile life recorders are typically unobtrusive and lightweight such that one or more mobile life recorders may be attached to a person or their clothing. In FIG. **1**B, mobile life recorder **22** is attached to the wrist of user **18** and mobile life recorder **24** is attached to the ear of user **18**. In one example, life recorder **24** corresponds to life recorder **240** in FIG. **1**A. A benefit of the positioning used by life recorder **24** is that its capture range may be inline with the viewing range of user **18** (i.e., the visual recording may correspond with what user **18** was looking at). By wearing mobile life recorders **22** and **24**, user **18** may record his or her life experiences as they occur. In one embodiment, mobile life recorder **24** generates a life recording and detects a particular object such as landmark object **29** in the life recording. Upon detection of landmark object **29**, life recorder **24** may automatically transmit the life recording to another computing device such as mobile device **210** in FIG. **1**A.

FIG. **1**C depicts the use of a non-mobile life recorder in a home environment. Non-mobile life recorder **10** may be positioned within a room in a home, such as the living room, in order to continuously capture and record life experiences that occur within the room. In FIG. **1**C, non-mobile life recorder **10** includes computing environment **12** and capture device **20**, in communication with each other. Computing environ-

ment **12** may include one or more processors. Capture device **20** may include a color and/or depth sensing camera that may be used to visually monitor one or more targets including humans and one or more objects including keys **26**, chair **28**, and dog **27**. In one example, capture device **20** may comprise a webcam and computing environment **12** may comprise a set-top box. In one embodiment, life recorder **10** generates a life recording and detects a particular object (e.g., keys **26**) or a particular situation (e.g., dog **27** jumping into chair **28**). Upon detection of the particular object or particular situation, life recorder **10** may automatically transmit the life recording to another computing device such as mobile device **210** in FIG. **1**A.

In one embodiment, capture device **20** may capture image and audio data relating to one or more targets and/or objects. For example, capture device **20** may be used to capture information relating to partial or full body movements, gestures, and speech of one or more users. The information captured by capture device **20** may be received by computing environment **12** and/or a processing element within capture device **20** and used to render, interact with, and control aspects of the life recorder. In one example, capture device **20** captures image and audio data relating to a particular user and processes the captured information to identify the particular user by executing facial and voice recognition software.

Suitable examples of life recorders, such as non-mobile life recorder **10**, and components thereof may be found in the following co-pending patent applications, all of which are herein incorporated by reference in their entirety: U.S. patent application Ser. No. 12/475,094, entitled "Environment And/Or Target Segmentation," filed May 29, 2009; U.S. patent application Ser. No. 12/511,850, entitled "Auto Generating a Visual Representation," filed Jul. 29, 2009; U.S. patent application Ser. No. 12/474,655, entitled "Gesture Tool," filed May 29, 2009; U.S. patent application Ser. No. 12/603,437, entitled "Pose Tracking Pipeline," filed Oct. 21, 2009; U.S. patent application Ser. No. 12/475,308, entitled "Device for Identifying and Tracking Multiple Humans Over Time," filed May 29, 2009, U.S. patent application Ser. No. 12/575,388, entitled "Human Tracking System," filed Oct. 7, 2009; U.S. patent application Ser. No. 12/422,661, entitled "Gesture Recognizer System Architecture," filed Apr. 13, 2009; and U.S. patent application Ser. No. 12/391,150, entitled "Standard Gestures," filed Feb. 23, 2009.

In one embodiment, the computing environment **12** and/or capture device **20** may be connected to an audiovisual device **16** such as a television, a monitor, or a high-definition television (HDTV) for displaying and/or playing one or more life recordings. In one example, the computing environment **12** may include a video adapter such as a graphics card and/or an audio adapter such as a sound card that may provide audiovisual signals associated with a computing application running on the life recorder. The audiovisual device **16** may receive the audiovisual signals from the computing environment **12** and may output visuals associated with one or more video recordings and audio signals associated with one or more audio recordings. In one embodiment, the audiovisual device **16** may be connected to computing environment **12** via, for example, an S-Video cable, a coaxial cable, an HDMI cable, a DVI cable, a VGA cable, or the like.

FIG. **2**A depicts one embodiment of a portion of a head-mounted life recorder, such as life recorder **240** in FIG. **1**A. Only the right side of head-mounted life recorder **140** is depicted. Head-mounted life recorder **140** includes right temple **102**, nose bridge **104**, eye glass **116**, and eye glass frame **114**. Built into nose bridge **104** is a microphone **110** for recording sounds and transmitting the audio recording to processing unit **136**. A front facing camera **113** is embedded inside right temple **102** for recording digital images and videos and transmitting the visual recordings to processing unit **136**. Front facing camera **113** and microphone **110** may be viewed as comprising a capture device similar to capture device **20** in FIG. **1**C. Microphone **110** and front facing camera **113** are in communication with processing unit **136**.

Also embedded inside right temple **102** are ear phones **130**, motion and orientation sensor **138**, temperature sensor **132**, and wireless interface **137**, all in communication with processing unit **136**. Motion and orientation sensor **138** may include a three axis magnetometer, a three axis gyro, and a three axis accelerometer. Processing unit **136** may include one or more processors and a memory for storing computer readable instructions to be executed on the one or more processors. Processing unit **136** may be viewed as comprising a computing environment similar to computing environment **12** in FIG. **1**C. Further details of capture devices and computing environments will be described below with reference to FIG. **2**B.

FIG. **2**B illustrates one embodiment of a life recorder **50** including a capture device **58** and computing environment **54**. Life recorder **50** may be a mobile life recorder or a non-mobile life recorder. In one example, computing environment **54** corresponds with computing environment **12** in FIG. **1**C and capture device **58** corresponds with capture device **20** in FIG. **1**C. In another example, and with reference to mobile life recorders **22** and **24** in FIG. **1**B, the capture device **58** and computing environment **54** may be integrated within a single housing.

In one embodiment, the capture device **58** may include one or more image sensors for capturing images and videos. An image sensor may comprise a CCD image sensor or a CMOS sensor. In some embodiments, capture device **58** may include an IR CMOS image sensor. The capture device **58** may also include a depth camera (or depth sensing camera) configured to capture video with depth information including a depth image that may include depth values via any suitable technique including, for example, time-of-flight, structured light, stereo image, or the like.

The capture device **58** may include an image camera component **32**. In one embodiment, the image camera component **32** may include a depth camera that may capture a depth image of a scene. The depth image may include a two-dimensional (2-D) pixel area of the captured scene where each pixel in the 2-D pixel area may represent a depth value such as a distance in, for example, centimeters, millimeters, or the like of an object in the captured scene from the camera.

The image camera component **32** may include an IR light component **34**, a three-dimensional (3-D) camera **36**, and an RGB camera **38** that may be used to capture the depth image of a capture area. For example, in time-of-flight analysis, the IR light component **34** of the capture device **58** may emit an infrared light onto the capture area and may then use sensors to detect the backscattered light from the surface of one or more targets and objects in the capture area using, for example, the 3-D camera **36** and/or the RGB camera **38**. In some embodiments, pulsed infrared light may be used such that the time between an outgoing light pulse and a corresponding incoming light pulse may be measured and used to determine a physical distance from the capture device **58** to a particular location on the targets or objects in the capture area. Additionally, the phase of the outgoing light wave may be compared to the phase of the incoming light wave to determine a phase shift. The phase shift may then be used to determine a physical distance from the capture device to a particular location on the targets or objects.

In another example, the capture device **58** may use structured light to capture depth information. In such an analysis, patterned light (i.e., light displayed as a known pattern such as grid pattern or a stripe pattern) may be projected onto the capture area via, for example, the IR light component **34**. Upon striking the surface of one or more targets (or objects) in the capture area, the pattern may become deformed in response. Such a deformation of the pattern may be captured by, for example, the 3-D camera **36** and/or the RGB camera **38** and analyzed to determine a physical distance from the capture device to a particular location on the targets or objects.

In some embodiments, two or more different cameras may be incorporated into an integrated capture device. For example, a depth camera and a video camera (e.g., an RGB video camera) may be incorporated into a common capture device. In some embodiments, two or more separate capture devices of the same or differing types may be cooperatively used. For example, a depth camera and a separate video camera may be used, two video cameras may be used, two depth cameras may be used, two RGB cameras may be used or any combination and number of cameras may be used. In one embodiment, the capture device **58** may include two or more physically separated cameras that may view a capture area from different angles to obtain visual stereo data that may be resolved to generate depth information. Depth may also be determined by capturing images using a plurality of detectors that may be monochromatic, infrared, RGB, or any other type of detector and performing a parallax calculation. Other types of depth image sensors can also be used to create a depth image.

As shown in FIG. **2**B, capture device **58** may include a microphone **40**. The microphone **40** may include a transducer or sensor that may receive and convert sound into an electrical signal. In one embodiment, the microphone **40** may be used to reduce feedback between the capture device **20** and the computing environment **54** in the life recorder **10**. Additionally, the microphone **40** may be used to receive audio signals that may also be provided by the user to control applications such as life recording applications or the like that may be executed by the computing environment **54**.

In one embodiment, the capture device **58** may include a processor **42** that may be in operative communication with the image camera component **32**. The processor **42** may include a standardized processor, a specialized processor, a microprocessor, or the like. The processor **42** may execute instructions that may include instructions for storing filters or profiles, receiving and analyzing images, determining whether a particular situation has occurred, or any other suitable instructions. It is to be understood that at least some image analysis and/or target analysis and tracking operations may be executed by processors contained within one or more capture devices such as capture device **58**.

The capture device **58** may include a memory component **44** that may store the instructions that may be executed by the processor **42**, images or frames of images captured by the 3-D camera or RGB camera, life recorder filters or profiles, or any other suitable information, images, or the like. In one example, the memory component **44** may include random access memory (RAM), read only memory (ROM), cache, Flash memory, a hard disk, or any other suitable storage component. As shown in FIG. **2**B, the memory component **44** may be a separate component in communication with the image capture component **32** and the processor **42**. In another embodiment, the memory component **44** may be integrated into the processor **42** and/or the image capture component **32**. In one embodiment, some or all of the components **32**, **34**, **36**, **38**, **40**, **42** and **44** of the capture device **58** illustrated in FIG. **2**B are housed in a single housing.

The capture device **58** may be in communication with the computing environment **54** via a communication link **46**. The communication link **46** may be a wired connection including, for example, a USB connection, a FireWire connection, an Ethernet cable connection, or the like and/or a wireless connection such as a wireless 802.11b, g, a, or n connection. The computing environment **54** may provide a clock to the capture device **58** that may be used to determine when to capture, for example, a scene via the communication link **46**. In one embodiment, the capture device **58** may provide the images captured by, for example, the 3-D camera **36** and/or the RGB camera **38** to the computing environment **54** via the communication link **46**.

As shown in FIG. **2**B, computing environment **54** includes image and audio processing engine **194** in communication with operating system **196**. Image and audio processing engine **194** includes gesture recognizer engine **190**, structure data **198**, processing unit **191**, and memory unit **192**, all in communication with each other. Image and audio processing engine **194** processes video, image, and audio data received from capture device **58**. To assist in the detection and/or tracking of objects, image and audio processing engine **194** may utilize structure data **198** and gesture recognition engine **190**.

Processing unit **191** may include one or more processors for executing object, facial, and voice recognition algorithms. In one embodiment, image and audio processing engine **194** may apply object recognition and facial recognition techniques to image or video data. For example, object recognition may be used to detect particular objects (e.g., soccer balls, cars, or landmarks) and facial recognition may be used to detect the face of a particular person. Image and audio processing engine **194** may apply audio and voice recognition techniques to audio data. For example, audio recognition may be used to detect a particular sound. The particular faces, voices, sounds, and objects to be detected may be stored in one or more memories contained in memory unit **192**.

In some embodiments, one or more objects being tracked may be augmented with one or more markers such as an IR retroreflective marker to improve object detection and/or tracking. Upon detection of one or more targets or objects, image and audio processing engine **194** may report to operating system **196** an identification of each object detected and a corresponding position and/or orientation.

The image and audio processing engine **194** may utilize structural data **198** while performing object recognition. Structure data **198** may include structural information about targets and/or objects to be tracked. For example, a skeletal model of a human may be stored to help recognize body parts. In another example, structure data **198** may include structural information regarding one or more inanimate objects in order to help recognize the one or more inanimate objects.

The image and audio processing engine **194** may also utilize gesture recognizer engine **190** while performing object recognition. In one example, gestures recognizer engine **190** may include a collection of gesture filters, each comprising information concerning a gesture that may be performed by a skeletal model. The gesture recognition engine **190** may compare the data captured by capture device **58** in the form of the skeletal model and movements associated with it to the gesture filters in the gesture library **192** to identify when a user (as represented by the skeletal model) has performed one or more gestures. In one example, image and audio processing engine **194** may use the gesture recognition engine **190** to

help interpret movements of a skeletal model and to detect the performance of a particular gesture.

More information about gesture recognizer engine **190** can be found in U.S. patent application Ser. No. 12/422,661, "Gesture Recognizer System Architecture," filed on Apr. 13, 2009, incorporated herein by reference in its entirety. More information about recognizing gestures can be found in U.S. patent application Ser. No. 12/391,150, "Standard Gestures," filed on Feb. 23, 2009; and U.S. patent application Ser. No. 12/474,655, "Gesture Tool" filed on May 29, 2009, both of which are incorporated by reference herein in their entirety. More information about motion detection and tracking can be found in U.S. patent application Ser. No. 12/641,788, "Motion Detection Using Depth Images," filed on Dec. 18, 2009; and U.S. patent application Ser. No. 12/475,308, "Device for Identifying and Tracking Multiple Humans over Time," both of which are incorporated herein by reference in their entirety.

FIG. **3** is a flowchart describing one embodiment of a process for automatically pushing life recordings to one or more target devices. The process of FIG. **3** may be performed continuously by a life recorder. The process of FIG. **3** may be performed by one or more computing devices. Each step in the process of FIG. **3** may be performed by the same or different computing devices as those used in other steps, and each step need not necessarily be performed by a single computing device. In one embodiment, the process of FIG. **3** is performed continuously by a life recorder such as life recorder **240** in FIG. **1**A.

In step **400**, a pushing filter associated with a life recorder is acquired. The pushing filter may include one or more rules (or requirements) for determining when to transfer data from the life recorder to a particular target device. If the one or more rules for determining when to transfer data from the life recorder to a particular target device have already been acquired, then step **400** may be omitted.

In step **402**, a life recording captured by the life recorder is acquired and analyzed. Information from both the life recorder generating the life recording and the life recording itself may be analyzed to determine whether a particular condition or situation has occurred. The analysis of the life recording may take into consideration context information, which includes information associated with the life recording but not necessarily acquired from the life recording itself (e.g., the GPS location of the life recorder, the date of a life recording, and the start and end times associated with a life recording). While a portion of a life recording is being analyzed, the life recorder may continue to capture new life experiences. In one embodiment, analysis may be performed on a portion of a life recording in real-time (i.e., as it is being captured), at regular time intervals (e.g., every 30 seconds), or upon a triggering event associated with the life recording (e.g., the user of the life recorder pushes a button). In one embodiment, step **402** includes steps **404**, **406**, and **408**.

In step **404**, a life recording captured by the life recorder is acquired. In one example, a capture device, such as capture device **58** in FIG. **2**B, may be used to acquire video and/or audio recordings of one or more life experiences. Once a life recording has been acquired, a portion of the life recording may be buffered to facilitate analysis of the life recording. For example, the last two minutes of a particular life recording may be stored in a memory buffer for analysis. In one embodiment, video and/or audio recordings captured by a life recorder over a particular period of time (e.g., 30 minutes) may be placed into a memory buffer. In the case of a cyclic buffer, if the video and/or audio recordings are not summarized and/or stored elsewhere within the particular period of time, then the data associated with the video and/or audio recordings may be overwritten.

In step **406**, context information associated with the life recording or some portion thereof is generated. Context information may include location and time information associated with the life recording. Location information may include GPS coordinates or other identification of a particular geographical location associated with the life recorder at the time of recording. Time information may include the particular date and time (e.g., a timestamp) associated with the life recorder at the time of recording. The location and time information may be generated by the life recorder itself via an integrated GPS device and time keeping device. The time information may also be obtained via the cloud. The context information may also include calendar information. In one embodiment, the life recorder acquires and considers calendar information associated with a user of the life recorder. The calendar information may include a description of the calendar event associated with the time of recording by the life recorder. In one example, at the time of recording a life recording, it may be determined that the time of recording is Jan. 11, 2011 at 2:05 p.m., the location of the life recorder is a particular GPS location, and the calendar information comprises the description "Meeting with client."

In step **408**, a particular situation from the life recording or some portion thereof is identified. A particular situation may be identified from a video recording and/or an audio recording. A particular situation associated with an audio recording may be identified using voice recognition techniques. For example, voice recognition may be used to identify the voice of a particular person (e.g., a spouse) or to identify a particular phrase or comment (e.g., a phrase used in an emergency situation such as a call for help). The particular situation may also be identified from an audio recording by detecting significant changes in the pitch of a person's voice or detecting sounds associated with particular human actions such as crying, gasping, or heavy breathing.

A particular situation associated with a video (or image) recording may be identified using object, pattern, and/or facial recognition techniques. For example, facial recognition may be used to identify a particular person and object recognition may be used to identify a particular object within a portion of a video recording. In one example, the particular situation identified may include detecting of a particular object (e.g., a soccer ball) and a particular person (e.g., a friend). In another example, the particular situation identified may include a particular gesture (e.g., waiving) being performed by the particular person. The particular situation may also be identified using machine learning techniques that employ probabilistic and/or statistical analyses to detect one or more targets and/or objects. The machine learning techniques may learn to detect particular targets and/or objects from analyzing a training set of the particular targets and/or objects. More information about applying machine learning techniques to detect targets and/or objects in image and video recordings may be found in U.S. patent application Ser. No. 12/972,837, "Detection of Body and Props" filed Dec. 20, 2010, incorporated herein by reference in its entirety.

In step **410**, it is automatically determined whether a push condition exists. If a push condition exists, then step **412** is performed. In some embodiments, a push condition is deemed to exist if the pushing filter is satisfied by the context information and one or more particular situations identified in step **402**. Further, some embodiments may require a receiving filter to also be satisfied by the context information and one or more particular situations identified in step **402**. If a push condition does not exist, then step **412** is not performed. In

one embodiment, regardless of whether a push condition is detected or not, the life recorder may continuously perform steps **402** and **410** in order to continuously check for the emergence of push conditions associated with newly captured life experiences.

In some embodiments, rather than a life recorder automatically determining the existence of a push condition, the push condition may be determined manually by a user of the life recorder. For example, when a user wishes to transmit a life recording, the user may physically push a button located on the life recorder or issue a specific voice command to the life recorder. Upon detection of the user's manual directive, the life recorder may transmit the life recording via the cloud or other network to a target device.

In step **412**, the life recording is automatically transmitted or pushed to a target device. The target device may be specified in the pushing filter. In one embodiment, the data transfer takes place over a wireless connection. In one example, an FTP or HTTP connection is established over a wireless local area network between the life recorder and the target device. In another embodiment, a life recording that includes both audio and video information is automatically transmitted to a target device. The target device may include a computing device such as a mobile device, web server, or a social networking server.

FIGS. **4**A-**4**B include flowcharts describing embodiments of a process for automatically detecting whether a push condition exists. The processes described in FIGS. **4**A-**4**B are only examples of processes for implementing step **410** in FIG. **3**. The processes of FIGS. **4**A-**4**B may be performed by one or more computing devices. Each step in the processes may be performed by the same or different computing devices as those used in other steps, and each step need not necessarily be performed by a single computing device. The processes of FIGS. **4**A-**4**B may be performed by a life recorder such as life recorder **240** in FIG. **1**A.

Referring to FIG. **4**A, in step **420**, it is determined whether the pushing filter is satisfied by the context information and particular situation identified in steps **406** and **408** of FIG. **3**. A pushing filter may be satisfied if any of the set of requirements contained within the pushing filter are satisfied. If the pushing filter is satisfied, then step **422** is performed. If the pushing filter is not satisfied, then no additional steps are performed. In step **422**, it is determined whether the target device has subscribed to receive the live feed. The life recorder may determine whether a target device has subscribed to receive a live feed by searching a list of subscribers stored on the life recorder. In some cases, a fee may be paid by a subscriber in order to be added to the list of subscribers. If the target device has subscribed to receive a live feed, then step **424** is performed. Otherwise, no additional steps are performed.

In step **424**, it is determined whether a receiving filter associated with the target device is satisfied by the context information and particular situation identified in step **402** of FIG. **3**. Each subscriber may provide to the life recorder a receiving filter that includes one or more requirements that must be satisfied prior to transmitting a live feed to the target device. If the receiving filter is satisfied, then step **426** is performed. If the receiving filter is not satisfied, then no additional steps are performed. In some embodiments, step **424** may also be omitted if no receiving filter is provided to the life recorder. In step **426**, it is determined whether a push condition exists or has otherwise been detected. In one embodiment, a push condition exists if the target device has subscribed to receive a live feed and both the pushing and receiving filters are satisfied.

Referring to FIG. **4**B, in step **430**, it is determined whether the pushing filter is satisfied by the context information and particular situation identified in steps **406** and **408** of FIG. **3**. A pushing filter may be satisfied if any of the set of requirements contained within the pushing filter are satisfied. If the pushing filter is satisfied, then step **432** is performed. If the pushing filter is not satisfied, then no additional steps are performed. In step **432**, a live feed transfer request is transmitted to the target device. In step **434**, the context information and particular situation identified in step **402** of FIG. **3** are transmitted to the target device. The context information and particular situation transmitted to the target device may be used by the target device to determine whether it should receive the live feed associated with the context information and particular situation. In step **436**, approval for the live feed transfer is received from the target device. In step **438**, it is determined whether a push condition exists or has been detected. In one embodiment, a push condition exists if the target device has received approval from the target device for the live feed and the pushing filter is satisfied.

FIG. **4**C depicts one embodiment of a pushing filter **602** and a receiving filter **612**. Pushing filter **602** includes a first set of requirements **604** and a second set of requirements **606**. The first set of requirements **604** determines when a live feed will be transmitted to an electronic address (e.g., an IP address, network address, or email address) associated with the term "<My Husband>." The second set of requirements **606** determines when a live feed will be transmitted to an electronic address (e.g., an IP address, network address, or email address) associated with the term "<My Sister Sally>."

Both the first set of requirements **604** and the second set of requirements **606** include fields for location, time, event, and situation. When all the fields in a set of requirements are satisfied, then the set of requirements is deemed to be satisfied. The location field corresponds with the geographical location for the life recording. The location field for first set of requirements **604** is assigned to a GPS location associated with the term "<My home>." The time field corresponds to the time of the life recording. Because the process for automatically pushing life recordings transmits the live feed in real-time, the time that the life recording is captured will be substantially the same as the time of the live feed transmission. The time field for the first set of requirements **604** may be satisfied anytime, while the time filed for the second set of requirements **606** may be satisfied only between the hours of 9:00 a.m. and 5:00 p.m. The event field corresponds with calendar information associated with a user of the life recorder. The event field for the second set of requirements **606** may only be satisfied if calendar information associated with the user of the life recorder specifies that the user is on vacation. The situation field corresponds with a particular situation that must be recognized or detected before automatically pushing a live feed. The situation field for the second set of requirements **606** may only be satisfied if the character Mickey Mouse is recognized.

Receiving filter **612** includes a first set of requirements **614**. In this example, the receiving filter may only be satisfied, and a live feed may only be transmitted, if the transmission occurs between the hours of 8:00 a.m. and 8:00 p.m. and the source of the live feed is an electric address associated with the term "<My Wife>."

FIG. **5** is a flowchart describing one embodiment of a process for automatically summarizing life recordings and updating recording summaries. The process of FIG. **5** may be performed continuously by a life recorder. The process of FIG. **5** may be performed by one or more computing devices.

Each step in the process of FIG. **5** may be performed by the same or different computing devices as those used in other steps, and each step need not necessarily be performed by a single computing device. In one embodiment, the process of FIG. **5** is performed continuously by a life recorder such as life recorder **240** in FIG. **1**A.

In step **502**, a summarizing filter associated with a life recorder is acquired. The summarizing filter may include one or more rules (or requirements) for determining when to summarize a life recording. If the one or more rules for determining when to summarize a life recording have already been acquired, then step **502** may be omitted.

In step **504**, a life recording captured by the life recorder is acquired and analyzed. Information from both the life recorder generating the life recording and the life recording itself may be analyzed to determine whether a particular condition or situation has occurred. The analysis of the life recording may take into consideration context information, which includes information associated with the life recording but not necessarily acquired from the life recording itself (e.g., the GPS location of the life recorder, the date of a life recording, and the start and end times associated with a life recording). In one embodiment, step **504** performs steps **404**, **406**, and **408** of FIG. **3**.

In step **506**, it is automatically determined whether a summarize condition exists. If a summarize condition exists, then step **508** is performed. In some embodiments, a summarize condition is deemed to exist if the summarizing filter is satisfied by the context information and one or more particular situations identified in step **504**. If a summarize condition does not exist, then no further steps are performed. In one embodiment, regardless of whether a summarize condition is detected or not, the life recorder may continuously perform steps **504** and **506** in order to continuously check for the emergence of summarize conditions associated with newly captured life experiences.

In step **508**, a recording summary is automatically generated from the life recording. In one embodiment, a recording summary may comprise video and audio recordings associated with the time duration during which a set of requirements in the summarizing filter is satisfied. In another embodiment, a recording summary may comprise a video recording and/or audio recording associated with the time duration for which a particular situation was identified. For example, referring to FIG. **1**C and in the case that a particular situation involves the appearance of a dog, if dog **27** enters the field of view for capture device **20** for a time duration of two minutes, then a recording summary may include the two minute video and audio recordings associated with the appearance of the dog. The resolution of the video and/or audio recordings may be adjusted depending on the time duration during which the particular situation was identified. A predetermined amount of time (e.g., 30 seconds) may also be added before and after the start and end times associated with the duration for which a particular situation was identified. In some embodiments, a recording summary may include images associated with start and end times associated with the identification of a particular situation. Additional images associated with time increments (e.g., every 2 minutes) between the start and end times associated with the identification of a particular situation may also be included. Moreover, an audio recording corresponding with the time duration during which the particular situation was identified may be converted into a text form and included in the recording summary.

In step **510**, the recording summary generated in step **508** is stored for future use. The recording summary may be stored locally in a non-volatile memory on a life recorder or remotely on a remote storage server, such as application server **250** in FIG. **1**A. The recording summary may also be stored in the cloud.

In one embodiment, a recording summary may be retrofitted or otherwise amended with images and/or audio not generated by the life recorder. For example, a recording summary regarding a vacation to a particular theme park may be amended to include an audio recording discussing the vacation recorded a year after the vacation. The recording summary may also be amended to include digital images of the particular theme park taken many years prior to the vacation. In one example, vacation photos of the particular theme park from the 1970s may be digitized and included within the recordings associated with the recording summary.

In step **512**, one or more recording summary indexes associated with the life recorder are updated. A recording summary index may include a file that contains pointers to one or more recording summaries. The index need not contain the actual video and/or audio recordings pointed to. In one embodiment, a life recorder stores a recording summary index locally and updates the index every time a new recording summary is generated and stored. In another embodiment, a remote storage device used to store one or more recording summaries stores and updates the recording summary index associated with the one or more recording summaries. Upon updating a recording summary index stored locally or on a remote storage device, a copy of the updated recording summary index may be pushed to one or more computing devices. In one example, referring to FIG. **1**A, application server **250** receives a recording summary from life recorder **240**, updates a recording summary index associated with one or more recording summaries generated by life recorder **240**, and pushes the updated recording summary index to mobile device **210**. Mobile device **210** may subsequently search the recording summary index and request recording summaries from application server **250**.

FIG. **6**A is a flowchart describing one embodiment of a process for automatically displaying on a first life recorder life recordings associated with a second life recorder. The process of FIG. **6**A may be performed continuously by a life recorder, upon a request from a user of a life recorder, or upon a triggering event associated with the life recording (e.g., the user of the life recorder pushes a button). The process of FIG. **6**A may be performed by one or more computing devices. Each step in the process of FIG. **6**A may be performed by the same or different computing devices as those used in other steps, and each step need not necessarily be performed by a single computing device. In one embodiment, the process of FIG. **6**A is performed by a life recorder such as life recorder **240** in FIG. **1**A.

In step **680**, a recording summary index associated with a second life recorder is acquired. A recording summary index may include descriptions of one or more recording summaries as well as pointers or links to the one or more recording summaries. If a recording summary index has already been acquired, then step **680** may be omitted.

In step **682**, a displaying filter associated with a first life recorder is acquired. The displaying filter may include one or more rules (or requirements) for determining when to acquire and display a recording summary. The displaying filter may allow recording summaries to be displayed that are related to a particular location or a particular time associated with a life recorder. A particular location may include a particular theme park or other geographic location at which the life recorder is deemed to exist. A particular time may include an anniversary

date associated with a current date and time of the life recorder. If a displaying filter has already been acquired, then step **682** may be omitted.

In step **684**, a life recording captured by the first life recorder is acquired and analyzed. Information from both the first life recorder generating the life recording and the life recording itself may be analyzed to determine whether a particular condition or situation has occurred. The analysis of the life recording may take into consideration context information, which includes information associated with the life recording but not necessarily acquired from the life recording itself (e.g., the GPS location of the life recorder, the date of a life recording, and the start and end times associated with a life recording). In one embodiment, step **684** performs steps **404**, **406**, and **408** of FIG. **3**.

In step **686**, it is automatically determined whether a display condition exists. If a display condition exists, then step **688** is performed. In some embodiments, a display condition is deemed to exist if the displaying filter is satisfied by the context information and one or more particular situations identified in step **684**. If a display condition does not exist, then no further steps are performed. In one embodiment, regardless of whether a display condition is detected or not, the life recorder may continuously perform steps **684** and **686** in order to continuously check for the emergence of display conditions associated with newly captured life experiences.

In step **688**, it is determined whether one or more entries in the recording summary index associated with the second life recorder are satisfied by the context information and the particular situation identified in step **684**. If an entry in the recording summary index is satisfied, then step **690** is performed. If no entries are satisfied, then no further steps are performed. In step **690**, a recording summary associated with a satisfied entry in the recording summary index is acquired. The recording summary, which was captured by a second life recorder, may be transmitted to the first life recorder over a wireless connection. In step **692**, the recording summary is automatically displayed. In one embodiment, the recording summary is displayed on the first life recorder. For example, the recording summary may be displayed by presenting a video recording on an LCD screen or retina display of the first life recorder.

In one embodiment, a grandson may take his life recorder to a theme park. The grandson's life recorder may store a recording summary index associated with his grandfather's life recorder. The recording summary index stored on the grandson's life recorder may have been preloaded by the grandson or automatically loaded and/or updated via a subscription to the grandfather's life recordings. By walking around the theme park (or a particular section of the theme park), the grandson's life recorder may determine that a display condition exists. Once the grandson's life recorder detects a display condition, it may search the recording summary index associated with his grandfather's life recorder. Upon satisfaction of one or more of the index entries in the recording summary index, one or more recording summaries associated with the grandfather's life recorder may be downloaded to the grandson's life recorder and automatically displayed.

FIG. **6**B illustrates a grandson and grandfather visiting a theme park together and utilizing the process of FIG. **6**A. In FIG. **6**B, a grandson and grandfather visit a theme park including a castle together in the year 2010 (highlighted illustration **698**) and, upon the existence of a display condition, view the grandfather's recording summaries of when the grandfather visited the theme park in the years 1955 (highlighted illustration **696**) and **1985** (highlighted illustration **694**).

FIG. **7** depicts one embodiment of a summarizing filter **622** and a recording summary index (or index of recording summaries) **672**. Summarizing filter **622** includes a first set of requirements **624** and a second set of requirements **626**. The first set of requirements **624** determines when a life recording summary will be generated and stored on a computing device associated with the term "<My remote storage>." The second set of requirements **626** determines when a life recording summary will be generated and stored on a computing device associated with the term "<Cloud storage location>."

Both the first set of requirements **624** and the second set of requirements **626** include fields for location, time, event, and situation. These fields are similar to those used by pushing filter **602** in FIG. **4**C. When all the fields in a set of requirements are satisfied, then the set of requirements is deemed to be satisfied. The location field corresponds with the geographical location for the life recording. The location field for first set of requirements **624** is assigned to a GPS location associated with the term "<My home>." The time field corresponds to the time of the life recording. The time field for the both the first set of requirements **624** and second set of requirements **626** may be satisfied anytime. The event field corresponds with calendar information associated with a user of the life recorder. The event field for the second set of requirements **626** may only be satisfied if calendar information associated with the user of the life recorder specifies that the user is "Meeting with Bill." The situation field corresponds with a particular situation that must be recognized or detected before automatically summarizing a life recording. The situation field for the first set of requirements **624** may only be satisfied if the object <My keys> is recognized.

Recording summary index **672** includes index entry **674** and index entry **676**. Both index entry **674** and index entry **676** include searchable fields for location, time, event, and situation. These fields are similar to those used in pushing filter **602** in FIG. **4**C. During a search of one or more index entries, if one or more fields in an index entry are satisfied, then that index entry may be deemed to be satisfied. Each index entry in a recording summary index may also be searched or queried based on one or more search criteria. Once an index entry has been satisfied, then a recording summary may be found or downloaded from the computing device assigned to the "link to summary" field. The "link to summary" field for index entry **676** is assigned "<Cloud storage location>," and therefore the corresponding recording summary for index entry **676** may be downloaded from the computing device associated with the term "<Cloud storage location>."

The disclosed technology may be used with various computing systems. FIGS. **8-10** provide examples of various computing systems that can be used to implement embodiments of the disclosed technology.

FIG. **8** is a block diagram of an embodiment of a gaming and media system **7201**. Console **7203** has a central processing unit (CPU) **7200**, and a memory controller **7202** that facilitates processor access to various types of memory, including a flash Read Only Memory (ROM) **7204**, a Random Access Memory (RAM) **7206**, a hard disk drive **7208**, and portable media drive **7107**. In one implementation, CPU **7200** includes a level 1 cache **7210** and a level 2 cache **7212**, to temporarily store data and hence reduce the number of memory access cycles made to the hard drive **7208**, thereby improving processing speed and throughput.

CPU **7200**, memory controller **7202**, and various memory devices are interconnected via one or more buses (not shown). The one or more buses might include one or more of serial and parallel buses, a memory bus, a peripheral bus, and a processor or local bus, using any of a variety of bus architectures. By way of example, such architectures can include an Industry Standard Architecture (ISA) bus, a Micro Channel Architecture (MCA) bus, an Enhanced ISA (EISA) bus, a Video Electronics Standards Association (VESA) local bus, and a Peripheral Component Interconnects (PCI) bus.

In one implementation, CPU **7200**, memory controller **7202**, ROM **7204**, and RAM **7206** are integrated onto a common module **7214**. In this implementation, ROM **7204** is configured as a flash ROM that is connected to memory controller **7202** via a PCI bus and a ROM bus (neither of which are shown). RAM **7206** is configured as multiple Double Data Rate Synchronous Dynamic RAM (DDR SDRAM) modules that are independently controlled by memory controller **7202** via separate buses (not shown). Hard disk drive **7208** and portable media drive **7107** are shown connected to the memory controller **7202** via the PCI bus and an AT Attachment (ATA) bus **7216**. However, in other implementations, dedicated data bus structures of different types may also be applied in the alternative.

A three-dimensional graphics processing unit **7220** and a video encoder **7222** form a video processing pipeline for high speed and high resolution (e.g., High Definition) graphics processing. Data are carried from graphics processing unit **7220** to video encoder **7222** via a digital video bus (not shown). An audio processing unit **7224** and an audio codec (coder/decoder) **7226** form a corresponding audio processing pipeline for multi-channel audio processing of various digital audio formats. Audio data are carried between audio processing unit **7224** and audio codec **7226** via a communication link (not shown). The video and audio processing pipelines output data to an NV (audio/video) port **7228** for transmission to a television or other display. In the illustrated implementation, video and audio processing components **7220-7228** are mounted on module **7214**.

FIG. **8** shows module **7214** including a USB host controller **7230** and a network interface **7232**. USB host controller **7230** is in communication with CPU **7200** and memory controller **7202** via a bus (not shown) and serves as host for peripheral controllers **7205(1)-7205(4)**. Network interface **7232** provides access to a network (e.g., Internet, home network, etc.) and may be any of a wide variety of various wire or wireless interface components including an Ethernet card, a modem, a wireless access card, a Bluetooth® module, a cable modem, and the like.

In the implementation depicted in FIG. **8**, console **7203** includes a controller support subassembly **7240** for supporting four controllers **7205(1)-7205(4)**. The controller support subassembly **7240** includes any hardware and software components needed to support wired and wireless operation with an external control device, such as for example, a media and game controller. A front panel I/O subassembly **7242** supports the multiple functionalities of power button **7213**, the eject button **7215**, as well as any LEDs (light emitting diodes) or other indicators exposed on the outer surface of console **7203**. Subassemblies **7240** and **7242** are in communication with module **7214** via one or more cable assemblies **7244**. In other implementations, console **7203** can include additional controller subassemblies. The illustrated implementation also shows an optical I/O interface **7235** that is configured to send and receive signals (e.g., from remote control **7290**) that can be communicated to module **7214**.

MUs **7241(1)** and **7241(2)** are illustrated as being connectable to MU ports "A" **7231(1)** and "B" **7231(2)** respectively. Additional MUs (e.g., MUs **7241(3)-7241(6)**) are illustrated as being connectable to controllers **7205(1)** and **7205(3)**, i.e., two MUs for each controller. Controllers **7205(2)** and **7205(4)** can also be configured to receive MUs (not shown). Each MU **7241** offers additional storage on which games, game parameters, and other data may be stored. Additional memory devices, such as portable USB devices, can be used in place of the MUs. In some implementations, the other data can include any of a digital game component, an executable gaming application, an instruction set for expanding a gaming application, and a media file. When inserted into console **7203** or a controller, MU **7241** can be accessed by memory controller **7202**. A system power supply module **7250** provides power to the components of gaming system **7201**. A fan **7252** cools the circuitry within console **7203**.

An application **7260** comprising machine instructions is stored on hard disk drive **7208**. When console **7203** is powered on, various portions of application **7260** are loaded into RAM **7206**, and/or caches **7210** and **7212**, for execution on CPU **7200**. Other applications may also be stored on hard disk drive **7208** for execution on CPU **7200**.

Gaming and media system **7201** may be operated as a standalone system by simply connecting the system to a monitor, a television, a video projector, or other display device. In this standalone mode, gaming and media system **7201** enables one or more players to play games or enjoy digital media (e.g., by watching movies or listening to music). However, with the integration of broadband connectivity made available through network interface **7232**, gaming and media system **7201** may further be operated as a participant in a larger network gaming community.

FIG. **9** is a block diagram of one embodiment of a mobile device **8300**. Mobile devices may include laptop computers, pocket computers, mobile phones, personal digital assistants, and handheld media devices that have been integrated with wireless receiver/transmitter technology.

Mobile device **8300** includes one or more processors **8312** and memory **8310**. Memory **8310** includes applications **8330** and non-volatile storage **8340**. Memory **8310** can be any variety of memory storage media types, including non-volatile and volatile memory. A mobile device operating system handles the different operations of the mobile device **8300** and may contain user interfaces for operations, such as placing and receiving phone calls, text messaging, checking voicemail, and the like. The applications **8330** can be any assortment of programs, such as a camera application for photos and/or videos, an address book, a calendar application, a media player, an internet browser, games, an alarm application, and other applications. The non-volatile storage component **8340** in memory **8310** may contain data such as music, photos, contact data, scheduling data, and other files.

The one or more processors **8312** also communicates with RF transmitter/receiver **8306** which in turn is coupled to an antenna **8302**, with infrared transmitter/receiver **8308**, with global positioning service (GPS) receiver **8365**, and with movement/orientation sensor **8314** which may include an accelerometer and/or magnetometer. RF transmitter/receiver **8308** may enable wireless communication via various wireless technology standards such as Bluetooth® or the IEEE 802.11 standards. Accelerometers have been incorporated into mobile devices to enable applications such as intelligent user interface applications that let users input commands through gestures, and orientation applications which can automatically change the display from portrait to landscape when the mobile device is rotated. An accelerometer can be

provided, e.g., by a micro-electromechanical system (MEMS) which is a tiny mechanical device (of micrometer dimensions) built onto a semiconductor chip. Acceleration direction, as well as orientation, vibration, and shock can be sensed. The one or more processors **8312** further communicate with a ringer/vibrator **8316**, a user interface keypad/screen **8318**, a speaker **8320**, a microphone **8322**, a camera **8324**, a light sensor **8326**, and a temperature sensor **8328**. The user interface keypad/screen may include a touch-sensitive screen display.

The one or more processors **8312** controls transmission and reception of wireless signals. During a transmission mode, the one or more processors **8312** provide voice signals from microphone **8322**, or other data signals, to the RF transmitter/receiver **8306**. The transmitter/receiver **8306** transmits the signals through the antenna **8302**. The ringer/vibrator **8316** is used to signal an incoming call, text message, calendar reminder, alarm clock reminder, or other notification to the user. During a receiving mode, the RF transmitter/receiver **8306** receives a voice signal or data signal from a remote station through the antenna **8302**. A received voice signal is provided to the speaker **8320** while other received data signals are processed appropriately.

Additionally, a physical connector **8388** may be used to connect the mobile device **8300** to an external power source, such as an AC adapter or powered docking station, in order to recharge battery **8304**. The physical connector **8388** may also be used as a data connection to an external computing device. The data connection allows for operations such as synchronizing mobile device data with the computing data on another device.

FIG. **10** is a block diagram of an embodiment of a computing system environment **2200**. Computing system environment **2200** includes a general purpose computing device in the form of a computer **2210**. Components of computer **2210** may include, but are not limited to, a processing unit **2220**, a system memory **2230**, and a system bus **2221** that couples various system components including the system memory **2230** to the processing unit **2220**. The system bus **2221** may be any of several types of bus structures including a memory bus, a peripheral bus, and a local bus using any of a variety of bus architectures. By way of example, and not limitation, such architectures include Industry Standard Architecture (ISA) bus, Micro Channel Architecture (MCA) bus, Enhanced ISA (EISA) bus, Video Electronics Standards Association (VESA) local bus, and Peripheral Component Interconnect (PCI) bus.

Computer **2210** typically includes a variety of computer readable media. Computer readable media can be any available media that can be accessed by computer **2210** and includes both volatile and nonvolatile media, removable and non-removable media. By way of example, and not limitation, computer readable media may comprise computer storage media. Computer storage media includes both volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules or other data. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical disk storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can accessed by computer **2210**. Combinations of the any of the above should also be included within the scope of computer readable media.

The system memory **2230** includes computer storage media in the form of volatile and/or nonvolatile memory such as read only memory (ROM) **2231** and random access memory (RAM) **2232**. A basic input/output system **2233** (BIOS), containing the basic routines that help to transfer information between elements within computer **2210**, such as during start-up, is typically stored in ROM **2231**. RAM **2232** typically contains data and/or program modules that are immediately accessible to and/or presently being operated on by processing unit **2220**. By way of example, and not limitation, FIG. **10** illustrates operating system **2234**, application programs **2235**, other program modules **2236**, and program data **2237**.

The computer **2210** may also include other removable/non-removable, volatile/nonvolatile computer storage media. By way of example only, FIG. **10** illustrates a hard disk drive **2241** that reads from or writes to non-removable, nonvolatile magnetic media, a magnetic disk drive **2251** that reads from or writes to a removable, nonvolatile magnetic disk **2252**, and an optical disk drive **2255** that reads from or writes to a removable, nonvolatile optical disk **2256** such as a CD ROM or other optical media. Other removable/non-removable, volatile/nonvolatile computer storage media that can be used in the exemplary operating environment include, but are not limited to, magnetic tape cassettes, flash memory cards, digital versatile disks, digital video tape, solid state RAM, solid state ROM, and the like. The hard disk drive **2241** is typically connected to the system bus **2221** through an non-removable memory interface such as interface **2240**, and magnetic disk drive **2251** and optical disk drive **2255** are typically connected to the system bus **2221** by a removable memory interface, such as interface **2250**.

The drives and their associated computer storage media discussed above and illustrated in FIG. **10**, provide storage of computer readable instructions, data structures, program modules and other data for the computer **2210**. In FIG. **10**, for example, hard disk drive **2241** is illustrated as storing operating system **2244**, application programs **2245**, other program modules **2246**, and program data **2247**. Note that these components can either be the same as or different from operating system **2234**, application programs **2235**, other program modules **2236**, and program data **2237**. Operating system **2244**, application programs **2245**, other program modules **2246**, and program data **2247** are given different numbers here to illustrate that, at a minimum, they are different copies. A user may enter commands and information into computer **2210** through input devices such as a keyboard **2262** and pointing device **2261**, commonly referred to as a mouse, trackball, or touch pad. Other input devices (not shown) may include a microphone, joystick, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to the processing unit **2220** through a user input interface **2260** that is coupled to the system bus, but may be connected by other interface and bus structures, such as a parallel port, game port or a universal serial bus (USB). A monitor **2291** or other type of display device is also connected to the system bus **2221** via an interface, such as a video interface **2290**. In addition to the monitor, computers may also include other peripheral output devices such as speakers **2297** and printer **2296**, which may be connected through an output peripheral interface **2295**.

The computer **2210** may operate in a networked environment using logical connections to one or more remote computers, such as a remote computer **2280**. The remote computer **2280** may be a personal computer, a server, a router, a network PC, a peer device or other common network node, and typically includes many or all of the elements described

above relative to the computer **2210**, although only a memory storage device **2281** has been illustrated in FIG. **10**. The logical connections depicted in FIG. **10** include a local area network (LAN) **2271** and a wide area network (WAN) **2273**, but may also include other networks. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets and the Internet.

When used in a LAN networking environment, the computer **2210** is connected to the LAN **2271** through a network interface or adapter **2270**. When used in a WAN networking environment, the computer **2210** typically includes a modem **2272** or other means for establishing communications over the WAN **2273**, such as the Internet. The modem **2272**, which may be internal or external, may be connected to the system bus **2221** via the user input interface **2260**, or other appropriate mechanism. In a networked environment, program modules depicted relative to the computer **2210**, or portions thereof, may be stored in the remote memory storage device. By way of example, and not limitation, FIG. **10** illustrates remote application programs **2285** as residing on memory device **2281**. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

The disclosed technology is operational with numerous other general purpose or special purpose computing system environments or configurations. Examples of well-known computing systems, environments, and/or configurations that may be suitable for use with the technology include, but are not limited to, personal computers, server computers, handheld or laptop devices, multiprocessor systems, microprocessor-based systems, set top boxes, programmable consumer electronics, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above systems or devices, and the like.

The disclosed technology may be described in the general context of computer-executable instructions, such as program modules, being executed by a computer. Generally, software and program modules as described herein include routines, programs, objects, components, data structures, and other types of structures that perform particular tasks or implement particular abstract data types. Hardware or combinations of hardware and software may be substituted for software modules as described herein.

The disclosed technology may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote computer storage media including memory storage devices.

For purposes of this document, reference in the specification to "an embodiment," "one embodiment," "some embodiments," or "another embodiment" are used to described different embodiments and do not necessarily refer to the same embodiment.

For purposes of this document, a connection can be a direct connection or an indirect connection (e.g., via another part).

For purposes of this document, the term "set" of objects, refers to a "set" of one or more of the objects.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

What is claimed is:

1. A method for transmitting data, comprising:

acquiring a first portion of a life recording as the life recording is being recorded on a life recorder, the acquiring is performed by the life recorder;

generating context information associated with the first portion, the context information includes location information associated with a location of the life recorder when the life recorder recorded the first portion;

identifying a person from the first portion, the identifying a person from the first portion is performed by the life recorder, the identifying includes determining an identification of the person based on the first portion of the life recording, the identifying a person from the first portion is performed using at least one of a voice recognition technique or a facial recognition technique on the first portion;

detecting a push condition, the detecting a push condition includes automatically comparing the identification of the person with one or more requirements for determining when to transfer data from the life recorder to a target device, the detecting a push condition includes automatically comparing the context information with the one or more requirements, the detecting a push condition includes detecting that the one or more requirements are satisfied by the context information and the identification of the person; and

automatically transmitting a second portion of associated with the life recording different from the first portion of the life recording to the target device, the automatically transmitting is performed in response to detecting the push condition, the automatically transmitting includes transmitting the life recording as a live feed to the target device,

wherein the first portion of the life recording corresponds with a first time period, the second portion of the life recording corresponds with a second time period subsequent to the first time period.

2. The method of claim **1**, wherein:

the life recording is one of a video recording, an audio recording, or an audiovisual recording.

3. The method of claim **1**, wherein: the location information includes a GPS location.

4. The method of claim **1**, wherein:

the generating context information includes acquiring calendar information associated with a user of the life recorder; and

the context information includes a description of a calendar event associated with the user of the life recorder, the calendar event associated with a particular time at which the acquiring a first portion of a life recording is performed.

5. The method of claim **1**, wherein:

the detecting a push condition includes determining whether the target device has subscribed to receive the life recording.

6. The method of claim **1**, wherein:

the detecting a push condition includes determining whether a receiving filter associated with the target device is satisfied by the context information and the identification of the person.

7. The method of claim **1**, wherein:

the life recorder is a mobile device associated with a first user; and

the target device is a mobile device associated with a second user different from the first user.

8. An electronic device for transmitting data, comprising:

a digital video camera, the digital video camera captures a live feed; and

one or more processors, the one or more processors in communication with the digital video camera, the one or more processors receive one or more requirements for pushing the live feed to a target device, the one or more processors generate context information associated with a first portion of the live feed, the context information includes location information associated with a location of the electronic device when the first portion of the live feed was recorded, the one or more processors identify a person from the first portion of the live feed and determine an identification of the person, the identifying a person from the first portion is performed using at least one of a voice recognition technique or a facial recognition technique on the first portion, the one or more processors determine whether the one or more requirements are satisfied based on the context information and the identification of the person, the one or more processors determine whether a receiving filter associated with the target device is satisfied based on the context information and the identification of the person, the one or more processors transmit at least the a second portion of the live feed different from the first portion of the live feed to the target device in response to determining that the one or more requirements and the receiving filter are satisfied,

wherein the first portion of the live feed corresponds with a first time period, the second portion of the live feed corresponds with a second time period subsequent to the first time period.

9. The electronic device of claim 8, wherein:

the one or more processors identify the person using facial recognition.

10. The electronic device of claim 8, wherein:

the electronic device is a mobile device associated with a first user; and

the target device is a mobile device associated with a second user different from the first user.

11. The electronic device of claim 9, wherein: the location information includes a GPS location.

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